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(Original Official Organ U. S. Vet. Med. Ass'n)

EDITED AND PUBLISHED FOR

The American Veterinary Medical Association

by W. H. Dalrymple, Baton Rouge, La.

CONTENTS

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VOL. LIV., N. S., VOL. 7. JANUARY, 1919. No. 4.

1919.

The year just closed has been one of extreme strenuosity, as well as of considerable anxiety, both at home and abroad. Every effort was put forth to bring the war to a successful termination, both by the military authorities of the different nations engaged and by those in civil life, to see that nothing was left undone to provide the necessary material needed by those in actual warfare.

There were periods during hostilities, however, that were punctuated by anxious moments, and it was not until well on in the past year that the light of complete success was in evidence, and the great object of the standard-bearers of humanity and civilization within sight of final achievement.

The war has, necessarily, caused disorganization in all lines of human effort, in the professions as well as in those of production on the farms and in the workships, and it may take some time to bring about normal conditions generally. However, the chief object has been attained; and as our country, especially, was able to transform a national life of peaceful occupation into one of combat in such an unprecedentedly short space of time, there seems every reason to anticipate that transformation in the reverse order will at least approximate the splendid effort made after we were actually at war.

The immediate future is not, of course, clearly revealed to us, but we have great reason to be thankful that the year 1919 opens with a cessation of hostilities, and that peace, when it is officially declared, is likely to be permanent and lasting.

Enforced production, especially in animal life, and its splendid results during the war, will, we believe, stimulate our farmers and stockmen to greater effort in the future in the growing of improved live stock of different kinds, which should mean a greater demand for competent veterinary aid; and if this should be so, which we think is more than probable, members of the profession who have been absent from home "doing their bit" in bringing "peace on earth," should, ere long, be able to resume their places in civil life with less difficulty, and in a shorter space of time, than might have been anticipated. Let us hope it may be so. Therefore, let us "ring out the old year and ring in the new" with the hope and determination that 1919 will be a most prosperous one for the profession as a whole—which is the sincere wish of THE JOURNAL.

SCIENCE AND THE LAITY.

It is questionable, we think, whether the most satisfactory results are secured from the discussion of purely scientific subjects before an association of mixed membership, and more particularly when investigations have not been completed and definite results not yet obtained. The lay members are more than likely to gain false impressions and get the idea forced on them that the scientific membership is by no means a unit, which may be true, with regard to some of our most important infections, and how to satisfactorily control and eradicate them. The result is, the layman is "up in the air," so to speak, and reflection is very likely to be cast upon the work of the scientist, who may be laboring earnestly to try to solve vital economic problems of such character.

These remarks have been prompted by the apparently unsatisfactory state of our present knowledge with reference to at least two infections which are of such economic interest to the country as a whole, viz., hog cholera and contagious abortion, and the discussion of them at the recent meeting of the United States Live Stock Sanitary Association in Chicago. In this, however, we are not reflecting on the intelligence of the lay members of

that organization, as they are not presumed to be familiar with scientific technicalities. What they are desirous of is the best practical sanitary information they can obtain, so that they may be in a position to use it to the best advantage in their respective states.

The question arises, therefore, would it not be better to confine purely scientific and technical discussion of conditions, not yet fully determined, to our professional gatherings and bring to the live stock sanitary meetings, where mixed membership obtains, the latest knowledge of practical sanitary procedure, to date, which has been gained from previous investigation and discussion?

This, it appears to us, would tend to avert possible criticism of our professional sanitarians—in fact, the profession generally; it would permit of more intelligent discussion by lay members, besides being more satisfying to them; it would benefit veterinarians themselves; and it would, we believe, create a more cooperative spirit among all who have to do with the sanitary control of our more costly animal ailments.

Unfortunately, all knowledge concerning the two diseases alluded to is not, as yet, in our possession; but there must be, from what we already know, some special or general line of sanitary procedure which, if intelligently understood and carried out, would have a marked bearing on control work generally.

Why, then, not leave the purely scientific side of the problem to the research men and the professional sanitarians to be discussed at their scientific gatherings, and devote more of the time of live stock sanitary meetings to discussions of the most practical sanitary methods which may have been evolved to date. We believe the matter will bear consideration.

AD VALOREM.

A duty faithfully discharged will commend any unit or collection of individuals to more responsible positions in life than, perhaps, any other one asset. There is a mysterious spirit in conjunction with faithfulness and loyalty that towers supreme above all other characteristics, and it permits the critic to be more charitable and forgetful of human weaknesses, being cognizant of the fact that if one does the best he can he has done the best anyone can do. After a conscientious duty has been

performed, it is undeniable evidence that the goal of perfection is being approached along the lines of the least resistance.

During the last eighteen months the patience of all men has been more sorely tried than ever before in the history of civilization, and the veterinary profession over the entire world has had its share of joys and sorrows. Our minds have been centered upon the battlefield where all the vocations in life have been ably represented and honored by their respective governments. No one profession stands out, particularly, as more useful for material advancement than another, and it would be the crest of selfishness to undertake to hold a different view. Notwithstanding this fact, all individuals and organizations must work out their own destiny on the merits of their usefulness to mankind.

In the memory of the younger class of veterinarians, the veterinary profession in the United States was without popular recognition, but, thanks to a number of faithful and gallant representatives, a record has been established on character and education which has proved to the people our right to grow, expand and prosper. The profession has demonstrated, beyond a reasonable doubt, that it can successfully control and eradicate the diseases domesticated animals are heir to, many of which are transmissible to man, which ultimately means the saving of thousands of human lives.

In all of this campaign of education and demonstration, the critics have never lost an opportunity to either praise or censure us, but we have emerged from the ordeal more determined than ever to stand completely alone upon our own achievements.

The golden opportunity for advancement has arrived, and if one could have selected a particular time better adapted for us to continue to shape and frame our destiny, he could not have improved upon the present. We can exhibit results based on efficiency, and, moreover, the necessity for a more perfect system in all branches of public veterinary service. Optimism should be our guiding star in order that hard experience may be turned into capital for future ambitions.

The battle of Armageddon has thrown three thousand veterinarians of the United States into the melting pot of nations, and they are proving themselves equal to the great adventure. After the battle for world democracy has been settled, when peace on earth and good will toward mankind shall reign supreme, and the carnage has been forgotten, we hope to stand

unveiled and unsullied before the world, welcoming criticism. We must absolutely forget personal greed in every undertaking we pursue, and hold the profession above individualism and politics which will bespeak for us the best and most convincing evidence ever presented to insure that a verdict of acquittal be returned which will guarantee that the name "Veterinarian" will be indelibly written in the minds of every intelligent citizen as standing for education in a branch of medicine that has made a place for itself on merit. E. I. S.

LET'S GET TOGETHER.

What would happen to the veterinary profession of North America if the A. V. M. A. were to fail? It's not, of course, and no one thinks it is even likely to fail in any way, but it would seem from certain angles of view that we are overlooking some opportunities to make our great national association what it should be, at least in the matter of membership.

Estimates made about three years ago indicated approximately between 15,000 and 16,000 veterinarians actively engaged in veterinary work in the United States. Many more are in Canada and veterinarians from both countries are eligible for membership in the A. V. M. A.

In view of the principles for which our Association stands, and its power for good to the profession in general, should it not represent a majority? Does it? Our roster totals about 4,000 names, less than 25 per cent of the total estimated number of veterinarians actively engaged in veterinary work in the United States alone.

Why is this? How can it be corrected? These are questions for each man to answer for himself in his own way, but are we individually and collectively doing all we can to secure new members and to retain the old ones?

These questions are prompted by views relative to the A. V. M. A. expressed by some of the veterinarians in the army during a recent "drive" at this camp (Greenleaf) for new members, the results of which, by the way, netted a total of 400 applications (in addition to those sent in prior to the Philadelphia meeting). Veterinarians in the M. O. T. C. at Camp Greenleaf come from every section of the United States and represent practically all veterinary colleges; thus a rare chance is afforded for

exchange of views. It seemed quite remarkable to note that rarely, if ever, are the advantages and objects of the A. V. M. A. brought to the attention of senior students just prior to graduation. Should this not be a matter to be attended to either by colleges or representatives of the Association? Several men from different colleges stated that no such action was the custom. Are we not overlooking good chances to acquire first rate new members?

Increased standards of veterinary education are rapidly adjusting themselves by a process of natural and forced evolution. Men with doubtful general or veterinary education are now rarely graduated; so is the time not now ripe to gather in every possible application from veterinarians of good moral standing? Would not such action serve to help the less perfectly educated man more than it would result in possible injury to the Association? Would not the power of the A. V. M. A. be greatly enhanced to have it really represent at least a majority of the veterinarians of North America? These are all pertinent questions and deserve consideration.

Many great and important opportunities will be before the A. V. M. A. for action during the next few years. The results of the war, as well as army life, have taught us the inestimable value of coöperation, and many veterinarians will now desire affiliation with the Association that had not formerly considered filing applications.

Let's take advantage of this spirit! Let's get together and put forth every effort to get new members. Start a campaign whereby no one will be overlooked. See that the matter is taken up by every college, every state and local association, every resident state secretary and every individual member. Let's try and secure a majority by 1920. Let it be said at the meeting next fall that the A. V. M. A. represents a majority of the veterinarians in North America. Let's have that as our 1919 slogan! The B. A. I. is coming in strong, the army has contributed its quota of new members; now let's have additional new blood from every state.

OTIS A. LONGLEY,
Captain, Veterinary Corps.

A PRELIMINARY NOTE ON INFECTIOUS KERATITIS.*

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Infectious bovine keratitis has a wide distribution. Outbreaks have been reported from time to time in India, Holland, South Africa, United States of America, and in the Western and Eastern provinces of Canada. There is a striking similarity in the symptoms manifested in these widely separated localities, but this does not preclude the possibility that the disease in these different countries is not due to the same causative agent.

REVIEW OF THE LITERATURE.

The earliest systematic work of which we have been able to find record is that reported by Frank S. Billings in Nebraska in 1888.

In stained sections of the diseased cornea, a short, thin bacillus with rounded ends was observed, which seemed to be of a marked pleomorphic type. Pure cultures of this organism were obtained, but no attempt was made to reproduce the disease with the bacillus, since previous experiments in which the exudate from a diseased eye was transferred to the eye of a healthy animal resulted in absolute failure. The disease could not be transmitted in this manner even when the cornea was previously scarified with a lancet. This writer concludes, however, that this evidence is not sufficient to disprove the infectious nature of the affection.

In Manitoba a number of outbreaks have occurred. In 1904, Hilton reported that this disease extended from Popular Point to Longburn, a distance of about forty miles. As a rule, 50 per cent of each affected herd developed the disease. As a result of ulceration, many of the animals became permanently blind. There is no record of any laboratory investigation having been conducted in this epizoötic.

Satyendra Nath Mitter, G. B. V. C., Bengal, giving the results of his investigation into an epidemic of contagious ophthalmia among conservancy cattle, in which the cornea was seriously involved, states that the outbreak appeared to be mainly caused by the Micrococcus lanceolatus and partly by the bacillus of

*Presented at 55th Annual Meeting A. V. M. A., Philadelphia, 1918.

Morax-Axenfeld. In this outbreak the period of incubation varied from three to seven days.

Mitter also found it impossible to produce the disease in experimental animals, and concludes that the organisms isolated in this epidemic appear to have no action on unbroken conjunctiva, but when brought in contact with an abraded surface they are liable to produce the disease. It is not stated whether experiments were conducted to verify this hypothesis.

A similar investigation was made in Holland by Dr. J. Poels. In the beginning of the work Poels assumed that the virus could not be found in a virulent form in the exudate, which, he states, is the result of a hypersecretion of the eyelids. He further reports that when the organism which he incriminated is found in the secretion, as is the case in slight affections, cultures can not be made therefrom because the bacilli have died as the result of bacteriolysis.

If the causative agent is hemmed up in the layers of the cornea, and does not escape in a virulent form with the secretion it is difficult to form a conception of the mode of infection in a natural outbreak.

Assuming that the live organism is not to be found in the exudate, Poels dissected out a portion of the diseased cornea, and microscopic preparations made from this showed myriads of bacilli having the morphologic characters of the Bacillus pyogenes. Cultures made from the same material resulted in the growth of a similar organism.

This experimenter could not reproduce the disease in healthy eyes by dropping pyogenes cultures on the cornea, but when cultures were injected between the layers of the cornea there rsulted a typical case of keratitis. This result is not astonishing, since the organism occurs in the inflammation of different organs in cattle, Poels himself having demonstrated the organism in thirty-eight out of fifty-six such cases.

Dr. Poels concludes from these experiments that the Bacillus pyogenes is the true cause of keratitis infectiosa in Holland.

PRESENT INVESTIGATION.

In the latter part of last month, Dr. H. D. Sparks, Veterinarian, Ottawa, called the attention of the Health of Animals Branch to a limited outbreak of an apparently infectious eye disease which involved a mixed herd on a farm near Aylmer, Quebec.

When the first case was reported it was thought to be due to mechanical injury; and it was not until a week later, when a second animal developed symptoms, that the disease was attributed to a possible infection. Six days later two other animals showed symptoms. The affected animals were placed under strict isolation, and after three weeks no further cases have been reported.

Symptoms.

The premonitory symptoms were marked lachrymation, photophobia and injection of the circumcorneal vessels and those of the

Infectious Keratitis.

—*J. A. Allen*

conjunctiva. There was little constitutional disturbance; only in one experimental animal was there a slight elevation of temperature observed (104.4°). In a few days the pain becomes more intense, and the cornea takes on a smoky haze, which in all cases observed began at a point just below the center of the cornea, and which ultimately spread over the entire surface. In four or five days the opacity becomes denser and as a result vision becomes impaired. At this stage two of the affected ani-

mals showed signs of recovery; but in the other cases the infiltration became even denser. The opacity was now of a yellowish color, and a fringe of blood vessels appeared in the marginal part of the cornea. In those cases which showed improvement, absorption of the intercorneal exudate began at the periphery and gradually extended towards the center of the cornea. A marked symptom at this time is the appearance of small protuberances upon the surface of the third eyelid.

When last seen the eyes of the severely affected animals showed little improvement under treatment, and there was a slight evidence of the beginning of ulceration. It is interesting to note that both eyes became affected in two of the animals under observation.

BACTERIOLOGY.

In direct smears made from the watery exudate, it was possible to demonstrate a short, thick, gram negative diplobacillus. These bacilli were not present in large numbers and in incipient cases could be demonstrated only after several smears had been made at the same time. Frequently the bacilli were found in clumps. There is not much pus produced in this disease, but when a particle could be secured the diplobacilli were fairly plentiful and were found lying between the leucocytes.

Before attempting to cultivate the organism, sterile swabs were saturated with the secretion from the diseased eye, brought to the laboratory, and immediately passed lightly over the conjunctiva of a healthy heifer. In six days intense lachrymation and photophobia were manifested, and in a few days the animal presented a typical case of keratitis. Two days later other swabs were procured in a similar manner, and in eight days the disease was reproduced in a young bull. Similar experiments conducted with rabbits and guinea pigs gave negative results. A diplobacillus was demonstrated in smears made from the exudate of the experimentally infected animals.

Several attempts to isolate the diplobacillus, seen in direct smears, on agar, resulted in failure; only a few colonies of staphylococci were grown. In subsequent work Loeffler's blood serum was employed, and the first culture gave an organism that closely resembled the diplobacillus in direct smears. However, while nearly always occurring in pairs, the bacillus seemed to be of a pleomorphic type, for some of the individuals appeared larger and some smaller than the original organism observed in

the smears from the swabs from which the cultures were made.

It has been found that the bacillus isolated by us agrees with several of the important published characteristics of the organism associated with infectious conjunctivitis in man, which was described by Morax and independently by Axenfeld in 1896.

In text-books there is a disparity in regard to some of the outstanding characteristics of this bacillus; for example, some writers state that the organism is incapable of producing disease in the lower animals, and that it is gram negative, while others ascribe to it just the opposite characters.

The following is a brief tabulation of the principal characters of the diplobacillus of conjunctivitis as given by the original communication of Morax:

"A microscopic examination of the watery secretion, which sometimes contains muco-purulent flakes, often gives negative results. When present in the exudate, the bacilli usually occur in pairs, end to end, but sometimes they are found clumped together.

Morphology—The bacilli are from two to three micra long and one and one-half micra broad, ends rounded, occur in twos or small chains.

Staining—Stains with all anilin dyes. Do not stain evenly when grown for some time on artificial media. Gram negative.

Blood Serum—Morax used serum agar or ascitic agar. In twenty-four hours grayish patches appear which are just a little more opaque than the surrounding media. In two or three days the colonies are about two millimeters in diameter, and their edges are more transparent than their centers. Other observers state that moist points appear on serum in 24 hours, which later form depressions due to liquefaction. Involution forms are produced.

Agar—Ordinarily there is no growth on any of the common media, but when an abundant culture is transferred into nutrient agar, some colonies may develop. This transference reduces the vitality of the organisms, so that they cannot be subcultured on agar.

Optimum Temperature—30° to 37° centigrade, grows slightly or not at all at room temperature (23°C).

Pathogenesis—Morax produced the disease in man in three days by the instillation of a pure culture; failed to infect a monkey, pigeons, or laboratory animals."

The biologic characters of the organism associated with this outbreak may be tabulated as follows:

Morphology—About awo micra long and one micron broad, occur in pairs end to end.

Staining—Stains with all common laboratory dyes, gram negative.

Blood Serum—In twelve to twenty hours small depressions appear due to liquefaction. When first isolated complete liquefaction of the media takes place in about five days; on subcultures this occurs more rapidly.

Agar—Could not isolate organisms from exudate on agar; subcultures planted on agar grew quite luxuriantly, giving a grayish, film-like growth which become wrinkled with age.

Optimum Temperature—Grows best at body temperature, but an appreciable growth is obtained at room temperature.

Pathogenesis—A pure culture instilled into the eye of a calf has failed in fourteen days to produce symptoms.

DISCUSSION OF RESULTS.

In view of our observations, an abrasion of the eye is not an essential factor in the production of infectious keratitis, although previous investigators have given this a prominent place in the etiology of the affection. Indeed, if an abrasion were necessary in all cases, the disease could not become so widely and rapidly disseminated as is the case in natural outbreaks.

It is probable that the disease is usually conveyed by contact, such as direct contact between the animals themselves or indirectly through the agency of flies. It is significant that the disease is more prevalent during the fly season. Nuttall and Jepson, Howard, and others have pointed out that ophthalmia among the natives in Egypt is largely transmitted by flies.

It would seem that when the disease attacks range cattle that the complications are more severe, for a large number of those involved show a permanent blindness as the result of ulceration. This is doubtless due to the aggravating influence of intense sunlight and dust. Such sequela did not occur in our experimental cases, which were stabled in darkened quarters as soon as they were visibly affected.

The fact that we have been unable so far to cause the disease by the instillation of pure cultures is attributable either to our not dealing with the causative organism or that the bacillus undergoes a change or becomes attenuated while growing upon artificial culture media.

SUMMARY.

(1) Previous investigators have been unable to reproduce infectious bovine keratitis in experimental animals by the instillation of pure cultures of the predominating organism or by the transference of the exudate.

(2) In this investigation the disease has been successfully transmitted by passing an infected swab over the conjunctiva of healthy animals.

(3) A diplobacillus having several of the prominent characteristics of the Bacillus of Morax-Axenfeld, which is associated with human conjunctivitis, has been isolated. The disease has not yet been artificially produced by the instillation of this organism. This may be the result of several causes, or possibly from the attenuation on artificial media.

(4) An abrasion of the eye is not an essential factor in the production of the disease.

(5) Flies may play an important role in the dissemination of the affection.

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My thanks are due to Dr. F. Torrance, Veterinary Director General, for permission to publish this report, and to Dr. S. Hadwen, Pathologist to the Department, for valuable suggestions and assistance in conducting the work.

HOG CHOLERA CONTROL IN THE EAST.*

EDWARD A. CAHILL, Indianapolis, Ind.

It seems customary for persons from Western states which have large numbers of swine to think that hog cholera is of small concern to Easterners because there are in comparison so few swine east of Ohio. It should be realized, however, that there are a very large number of herds of registered swine in the East and also that an enormous amount of money is invested in the business of feeding garbage to swine. Although the total number of swine in the six New England states, for instance, would not equal in number those in one Western state, it is, nevertheless, a fact that the number of persons interested in the control and eradication of hog cholera is very large. The difference in the number of animals can be ascribed to the smaller size of the herds and not to the number of persons who actually own swine.

A feature which has considerable bearing on the subject of hog cholera control in this section is the number of herds in which the animals are fed garbage. In the state of Massachusetts, for instance, it is estimated that 90 per cent of all swine are fed upon garbage. Herds of swine varying in number from 500 to 5,000 animals fed upon this waste product are to be found in the vicinity of almost all Eastern cities. This method of garbage disposal has been followed extensively for many years and has been limited only by the amount of garbage available and until recently by hog cholera. With the exception of a few of the larger Western cities, this practice has not been followed to any extent in other sections of the country. During the past year interest in this method of feeding has become widespread, and the demand for garbage for feeding purposes exceeds the supply in every section of the country. The reason for this demand may be ascribed to several causes, among which may be mentioned a more careful study of the success which has followed this practice in the East, the rapidly increasing cost of other food stuffs, and the universal demand for the conservation of everything capable of being conserved. The garbage from most of the army cantonments is being fed to swine, although in many cases they are located in sections of the country where heretofore this product has been disposed of in some other manner. These conditions

* Presented at 55th Annual Meeting A. V. M. A., Philadelphia, 1918.

all tend to make more valuable the experiences of Eastern states in controlling hog cholera.

A general survey of the Eastern states shows that the lack of uniform control methods is just as pronounced as in other sections. Thus we see states where no real effort is made to control the disease and where it is allowed to spread or be spread either by natural means or by the promiscuous use of virus. Other states urge the use of serum while discouraging the use of virus, while still others advise and officially administer the simultaneous treatment.

It should be kept in mind that in the majority of cases the live stock sanitary authorities promulgated their control measures in accordance with what appeared to be best for the live stock interests of their respective states. This, of course, does not apply to states where control measures are lacking entirely or are political control rather than disease control measures. In certain states where previously the simultaneous treatment has been prohibited the demand on the part of owners of pure-bred stock and by garbage feeders for permission to have their swine immunized by the simultaneous treatment has increased enormously. These stockmen realize that any transitory form of immunity against hog cholera is of no practical value to them since an active immunity can be procured at practically the same cost as a passive immunity from the injection of serum. In the past the demand of these men has been offset by the desire of the live stock sanitary authorities to keep clean territory from becoming infected by the use of virus. However, knowledge that the simultaneous treatment is being administered under proper restrictions in other states without infecting new territory is not lost upon these men. As a result, their demand to be given the same advantages as breeders and feeders in other states seems justifiable and a change in the regulations of such states seems not only probable but desirable. It is to be hoped, however, that when such changes are made every precaution will be taken to insure the use of these products only by competent officials under state control, rather than to make possible the spread of the disease as has occurred in certain states by the misuse of serum and virus.

In this connection it is interesting to note that the live stock interests in the state of Connecticut were responsible for the passage of a law which places the administration of all serum and virus under absolute state control, whereas previously these

products were used by both veterinarians and laymen. The live stock sanitary authorities of that state were not among those desiring the law, but, rather, were hostile to the same, notwithstanding the fact that the enforcement of the provisions of the law gives them greatly enlarged powers. The results of the change in that state are most gratifying, since fewer outbreaks of the disease are noted, and swine are being immunized in larger numbers than at any previous time. Cases of this kind indicate that swine owners in the East are not in favor of having their swine immunized either by themselves or county agents, as is done in other sections. The fact that many of our Eastern states appropriate larger amounts of money each year for the prevention of contagious diseases in animals than is done in some Western states, where the number of animals is considerably greater, is testimony of their appreciation of the services of veterinarians and state control measures. It is to be expected that the very best control methods known should in return be given by officials charged with this work, and that existing disease control methods should be as liberal and practical as is consistent with public safety. These conditions should serve as an indicator of the times to officials in states which are noted for their lack of efficient control measures. It indicates that in the East the live stock interests are awake to the need of proper laws and control measures regarding hog cholera and will be the means of procuring the same if officials fail to do so.

Since the writer is no longer connected with the work which is being done in Massachusetts, he feels that he may with propriety refer to the remarkable showing made by that state in controlling hog cholera. The control methods which have been in effect for over four years in that state were original, and at the time of their adoption were considered the most drastic which had been adopted in an attempt to control hog cholera. The results of these control methods have been so satisfactory that they are now considered not drastic, but model, and because of their effectiveness are now being adopted in their most salient points by other states.

Briefly, the important points of the Massachusetts system may be given as follows: All anti-hog cholera serum and hog cholera virus to be used in that state are tested by the Department of Animal Industry upon their arrival, regardless of any previous tests. If these products pass a satisfactory test they can then be administered only by veterinarians who are employed *by* and

responsible *to* the state. The outstanding advantages of this method may be summarized as follows:

1. It prevents the use of virus which lacks virulency and serum lacking potency.
2. It minimizes faulty technic.
3. It unifies the method of application, dosage and technic.
4. It makes possible the enforcing of quarantine and sanitary regulation which cannot possibly be obtained by the private veterinarian regardless of his professional ability.
5. It makes possible the procuring of accurate reports, data and statistics.

In more than four years since the adoption of this method there has not been an instance where non-infected territory has become infected from the use of virus, nor where the disease has been spread by its use. Although the method was at first received by swine owners with skepticism, the good results which have been obtained have won their universal approval, and at this time there are practically no large herds in the state, either grades or registered, which are not immunized by the state authorities, while the owners and the general public are ardent advocates of the simultaneous treatment, as well as of absolute state control.

The effectiveness of this method and the desirability of the adoption of methods along similar lines by other states may be seen by a study of page 40 of the report of the Commissioner of Animal Industry for 1917, a copy of which is reprinted on the following page.

COMPARATIVE STATISTICS ON HOG CHOLERA FOR 1914, 1915, 1916 AND 1917.

	1914.	1915.	1916.	1917.
Outbreaks reported in which a negative diagnosis was made	20	122	57	42
Number of herds known to be infected	80	227	253	359
Number of herds known to be infected in which serum treatment was not administered	.....	77	43	77
Number of infected herds in which serum treatment was administered	65	150	192	283
Herds Infected at the time Treatment was administered				
Number of animals receiving "serum only" treatment, including infected animals and those too young for simultaneous treatment.	428	10,300	14,747	24,828
*Mortality from hog cholera following "serum only" treatment (per cent)	9.5	7	3.7	1.75
Number of animals receiving the simultaneous treatment. These are "apparently healthy" animals in herds infected at time of treatment	591	5,826	13,643	15,524
*Mortality from hog cholera following the simultaneous treatment in infected herds (per cent)	2	1.2	.6	.44
Total number of animals treated in infected herds	†1,019	16,126	28,390	40,352
*Total mortality following both "serum only" and simultaneous treatment in infected herds (per cent)	5.2	4.9	2.21	‡1.24
Preventive Inoculation in Herds in which no Infection was Apparent				
Number of herds immunized	2	95	§113	§470
Number of animals immunized	104	863	7,657	10,870
Number of animals which died from hog cholera following immunization	0	1	0	3
Total number of animals treated	5,123	16,989	36,047	51,222

* These figures show percentages, not animals.

† Plus 4,000 which were treated, and died or were killed before results could be ascertained. These deaths were due to the use of serum which was impotent and virus which was not virulent, before the present regulations were made.

‡ This does not include approximately 50 animals which died on one farm, on which a final diagnosis has not been made. Clinically, and by autopsies, it was impossible to determine whether the disease was hog cholera or hemorrhagic septicemia. Laboratory examinations indicate the latter, but before the work could be completed the losses stopped, and more material which was needed for a final diagnosis was not available.

§ The large majority under this classification are herds which in previous years were classified as infected herds and which had yearly sustained heavy losses from hog cholera. The majority of them are garbage-fed, and experience shows that should immunization be stopped an outbreak of hog cholera would follow very closely. They are therefore classified as herds in which no infection was apparent at the time of treatment, whereas in reality they are infected hrds in which the disease is kept completely under control while immunization is continued.

It may be said without fear of contradiction that the statistics given make the most remarkable showing which has followed any organized effort to control hog cholera. The work done in that state shows that the mortality from the use of virus can be practically eliminated and that the simultaneous treatment can be used in any section without infecting new territory. It should be borne in mind, however, that the work was carried out under absolute state control and consequently under more favorable

conditions and with more favorable results than could be obtained otherwise.

The method described above makes possible the close observation of all herds of swine upon which serum and virus are used, as well as results of the application of these products which can not be obtained in states where less thorough control measures are in force.

During 1915, while the writer was engaged in state control work, it became necessary to have some definite facts regarding the immunization of "baby pigs." Previous to that time it was our custom to administer the simultaneous treatment to pigs from two to eight weeks of age. In herds where this was done "breaks" frequently followed when the animals weighed from 60 to 200 pounds. Although serum producers and some state authorities advocate that the simultaneous treatment be repeated when the animals weigh from 50 to 60 pounds, we felt that many animals would retain sufficient immunity from the original treatment to make a permanent immunity from the second treatent an uncertainty. To determine this point the following experiment was conducted: 852 pigs weighing from 15 to 30 pounds were given 30 cc of serum and 2 cc of virus. During the experiment the animals were kept under environment to which they were accustomed and at varying periods, as shown in the following table, they were injected with 4 cc of hog cholera virus each. Before virus was administered the second time 52 animals died from various causes and are not included in the table.

Number given virus	200	200	150	150	100
Average weight at time virus given	60	85	110	150	200
Virus given — weeks after vaccination	8	12	16	20	24
Number which developed cholera as result of receiving virus	42	96	78	97	72
Percentage of animals susceptible at that time	21%	48%	52%	64.7%	72%
Number which contracted cholera at a later date from pen infection	62	41	8	2	....
Percentage of original number which developed pen infection	31%	20½%	5⅓%	1⅓%	....
Total number which failed to receive lengthy immunity from first treatment	104	137	86	99	72
Percentage of susceptible animals regardless of treatment as "baby pigs"	52%	68½%	57⅓%	66%	72%

The most important conclusion to be drawn from this experiment is the large percentage of animals which, treated as "baby pigs," fail to retain their immunity for a lengthy period. Thus it is seen that from 52 to 72 per cent of all animals so treated failed absolutely to carry sufficient immunity to protect against the disease when exposed to a really virulent infection a short

time afterwards. As a result the application of the simultaneous treatment to "baby pigs" was discarded as a control measure. It has been noted that many hogs which are treated as "baby pigs" and which apparently have been immune will quickly develop hog cholera if shipped to herds where the swine are fed upon garbage. In this case their immunity is really subjected to test, whereas in the former case only a supposed immunity existed. The supposed immunity conferred to "baby pigs" by the simultaneous treatment will be found wanting in the majority of cases if these animals are really subjected to a virulent infection.

The results of the above described experiment also convinced us that attempts to obtain permanent immunity by repeating the simultaneous treatment was too uncertain in its results on account of the varying treatment. As a state control method it was considered dangerous and was discarded. Since that time young pigs are treated as follows: At weaning time (usually six weeks in the East) pigs are given serum-only treatment, six weeks later they are given the simultaneous treatment, using 2 cc of virus. Since adopting this method outbreaks of hog cholera in herds so treated are practically unknown, regardless of the length of time the animals are kept or the amount of infection to which they are exposed.

The writer is aware of the fact that the experiences described may not coincide with observations or experiences of investigators in other parts of the country. In this respect it would be wise for us to refrain from the tendency to become sectionalized by feeling that the conditions which apply to any particular section must necessarily apply to the entire country. There are certain differences in results obtained in different parts of the country which are difficult to understand. For instance, passive immunity conferred by serum-only treatment in the East seldom or never fails to last for six weeks. In some sections of the Middle Western states this same type of immunity lasts for only three weeks, whereas in several of the extreme Western states it is reliably reported to last for eight weeks, notwithstanding the fact that the same class of serum was used in all cases. Likewise, it has been noted that the immunity transmitted to pigs from sows immunized by the simultaneous treatment varies greatly in its duration. Thus, in some Western states it is found that such pigs develop hog cholera in seven to fourteen days after birth, whereas in the East it has been found that the pigs from sows treated in

exactly the same manner by the same product practically never develop hog cholera until they are at least six weeks of age.

It is rather difficult to understand just why these differences should be found, but the fact that they do exist raises many questions in immunology upon which a large amount of experimental work needs to be done.

DIFFERENTIAL DIAGNOSIS OF DISEASES OF SWINE.*

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GENERAL STATEMENT.

Of all the vital problems confronting the veterinarian and the veterinary profession today none is more important than the need for a better understanding of the diseases of swine that will lead to more complete and reliable methods for their prevention and control. The demand for this comes direct from those engaged in the swine industry; the necessity is a national one, and the opportunity offered is one practically unequalled to the veterinarian and the veterinary profession; and when I say this I am thinking of the great central west, the far west, and the south, and not of certain limited areas where a special line of animal industry predominates.

The work of the practitioner of veterinary medicine, or the development of "pig practice," as so many term it, has increased remarkably in the last few years. In the early days the owner seldom considered that it was worth while to call a veterinarian in case of sickness among pigs. The beginning of this phase of practice came later when the calls were almost wholly to deal with conditions that involved consideration for the safety of the herd. During the last few years the swine industry and our understanding of the diseases of swine has progressed to the point where calls to treat individual animals are of almost daily occurrence. Calls to treat pigs represent a surprisingly large percentage of the total number that a veterinarian receives. A conservative estimate for the average veterinarian in Iowa would be that 40 per cent of the calls he receives are to deal with diseases of pigs, either of the herd or of the individual, and that this phase of his practice, while representing 40 per cent of the calls, on

* Presented at 55th Annual Meeting A. V. M. A., Philadelphia, 1918.

the other hand represent 60 per cent of his business. While wonderful progress has been made in the investigation of diseases of swine and in the prevention and treatment of many of these conditions, experience under present and everyday conditions shows that there are some very important and serious gaps to be filled before we as a profession can feel that we are adequately meeting the problems of swine diseases as a whole.

Consideration, study, and progress in relation to swine diseases in the United States can in general be divided into three separate and rather distinct periods. From 1833 to 1880 may well be called the descriptive period, for during this time many able men wrote extensively of the clinical and anatomical nature of the infectious fevers of swine. From 1880 to 1903 may well be called the etiological period, for during those years a vast amount of work was done in search of a specific cause of the diseases of swine. From 1903 to the present time may well be known as the period of application, as during this time the information previously gained has been put to practical use. It was during the early part of this last period that a new classification was worked out to conform to the etiological findings.

In general, our information regarding swine diseases has come through three distinct agencies or channels: the Federal government, state activity, and the practitioner. The first and most general work was by the Bureau of Animal Industry, United States Department of Agriculture, and was undertaken because of the prevalence, rapid spread, and very severe losses from disease among swine in various parts of the country. Investigation and research on the infectious and contagious diseases of swine by the Bureau of Animal Industry since its organization have progressed with most gratifying results. Data of a very material nature has come as a result of the meat inspection service and through the work on the production of anti-hog cholera serum, especially in virus production.

State activity in the investigation and research on the diseases of pigs has naturally been most seriously undertaken in those states where the swine industry is of major importance. The state work has been directed along the same general line as that undertaken by the Federal government, but state activities have naturally come into more intimate contact with a greater variety of conditions that result in isolated losses, which are, however, of great economic importance. With the development of state laboratories for the diagnosis of animal diseases, and

through coöperation with the practitioners, the state work is in a position to ultimately become accurately acquainted with all the cases of individual losses, as well as with those infectious and non-infectious conditions that are so frequently general to the herd.

The investigation and research work on the diseases of swine by the United States Department of Agriculture has resulted in publications dealing with certain specific infectious diseases as such. The meat inspection service has furnished data on the conditions found in a special class of pig—that is, the market type. Serum production has dealt largely with the shoat from 50-100 pounds and the data obtained from postmortem on virus pigs has been largely for hog cholera which was artificially produced. The pig was clinically healthy to start with and was kept under artificial conditions, all of which has in a large measure eliminated field conditions under which the great majority of pigs are kept, as well as being from a special type of pig, and, finally, in only isolated instances has any attempt been made to study or even record the conditions found upon postmortem examination other than to recognize cholera, and in general the presence of secondary infections that are of importance in the production of serum. In general, the same is true of the nature of the information coming from state investigation work, but, as stated before, state work has through the laboratories and field men for the diagnosis of animal disease come into more immediate contact with field conditions. Beyond all this there is the vital, practical, and fundamental phase of this problem as it is encountered by the men engaged in practice. The practitioner comes in contact almost daily with conditions as they occur in the field, as they affect all types, ages, and classes of swine; with those conditions that favor the occurrence of complications, the multiple instances of mixed and secondary infection, sporadic and organic diseases, sanitation, and ventilation common to farm conditions; with the problems of disease in connection with breeding; with the question of the health and protection of the pure-bred herd and with the very important problem in connection with the health and care of very valuable individuals in these herds. While the veterinary practitioner is the only agency that has come in direct daily contact with the many complicated cases in regard to the diagnosis and treatment of swine, they have as a class from the very nature of things never given to the profession the benefit of their findings in the form of publication,

and as a result this fundamental and essential information is not available for the use and guidance of many. Even with the wonderful progress that has been made, I am sure that most of you will agree with me that there is still a great deal to be accomplished, for, while we have more or less definite knowledge and rather complete descriptions of certain specific diseases of pigs, in most cases these are from only one standpoint: the anatomical findings, the etiology, and in others from the history and clinical symptoms, and only in a few instances is our information on the diseased conditions of swine complete and definite in regard to all these points, nor do the publications go into detail in regard to the symptoms and lesions as they are so frequently found and modified under field conditions. We are, therefore, decidedly handicapped in not having complete information regarding many of the rather common infectious diseased conditions in pigs, in not understanding thoroughly the many local and organic diseases that so frequently cause the death of the individual, and in not understanding the great frequency of mixed infections and the numbers and identity of organisms that enter as causes of these mixed infections, and, lastly, in the past that no serious attempt has been made to compile the information we already have regarding the diseases of swine so as to make it available for the man engaged in field work.

In the past—and very largely at the present time—if a sick herd of pigs, or even a sick pig, was under observation the outstanding question was, Is it hog cholera? If cholera, certain definite steps are to be followed; if not cholera, no special effort in the past was made to make a diagnosis or carry out treatment; in fact, almost no attempt was made to handle diseases outside of hog cholera and swine plague other than to suggest that the herd be given some general tonic or worm mixtures.

Further, until recently the owners of large herds of swine have been perfectly satisfied to save the herd from cholera and take the losses that came from other causes as a natural one; in fact, this has seemed economically satisfactory to the breeder. When cholera was prevalent in its most destructive form—for example, during the years 1910-13, when 95 per cent of all losses of pigs from disease in Iowa was directly or indirectly from cholera—it was only natural and was perfectly safe for a veterinarian to suggest a diagnosis of hog cholera without leaving his office and be perfectly justified in recommending vaccination. The government and state agents could proceed on the basis of

cholera with assurance of the most gratifying results. At present, however, after bringing the disease under control by the use of anti-hog cholera serum and better sanitary conditions as they affect the development and spread of cholera and possibly from a natural subsidence of this disease in its more acute epizootic and destructive form, at least it is far less common and apparently less destructive, a change has come that demands a far more careful consideration before proceeding. Therefore, as cholera is more completely under control and the conditions surrounding the economic production of swine have materially changed, we can plainly see that the many isolated diseases of pigs are frequent and of great economic importance. This does not necessarily mean these numerous sporadic and organic diseases were not present before, but, rather, that they were obscured by the frequency and prevalence of cholera and the loss of a few individuals was not a serious item, nor does this mean that the fundamental character of diseases has changed. They are the same as before, but are somewhat modified and somewhat different in form, appearance, and frequency. This has come from the control of certain diseases, from the more frequent occurrence of others because of conditions that favor their spread and development* and, therefore, we have from time to time, depending upon the prevalence of this or that disease, a somewhat modified clinical picture and often a very complicated morbid anatomy in the field of swine diseases as a whole. Thus the occurrence and clinical picture of the diseases of swine in a given herd, community, or state is different from what it was only a short time before. Further apparent differences exist in regard to the infectious diseases of swine and especially in cases of hog cholera and swine plague, due to the fact that we have disposed of an enormous number of morbid conditions that were formerly classed along with cholera, and that the clinical study of the diseases of swine has become refined so that we are able more accurately to classify them. In this respect we have only made a beginning and the clinical pathological methods of diagnosis of swine diseases must still undergo further scientific differentiation if we as a profession are to meet with satisfactory success in the diagnois and handling of the diseases that are common to this species of animal.

The question is often put as to whether the symptoms of the diseases of swine are possible of as fine a differentiation as are

* (Ex. infectious enteritis, necrobacillosis.)

the symptoms of disease in other species. Have we always to think of the disease of pigs in terms of the herd and not deal directly with the individual, or can we through study and understanding see the time not far distant when it will be possible to make as accurate a differentiation, clinically and anatomically, of the diseases of swine in both the individual and the herd as we make of the diseased conditions met with in horses and cattle?

In carrying out the various steps and processes necessary and essential in making a differential diagnosis of the diseases of swine one must have at his command at least the outstanding characters, clinical and anatomical, of all the diseased conditions that may possibly occur in the pig to the extent that they would serve as a guide at the time of the examination. The practitioner who has an important swine practice must be familiar with the diseases of pigs common to his community, state, and section of the country. He must have the diseases fixed in his mind in groups, *i. e.*, those having similar clinical symptoms and morbid changes, and then he must carry out step by step the elimination of the conditions that he is to take into consideration and by this process of elimination bring his observation and study to a successful conclusion in considering the herd itself or the individual animal. The first inquiry should be regarding the history. This is of great value and should include a history of the premises, a history of the herd, a history of the individual, a history of the feeding, water, and usually of stock foods, and a history of the movements of the owner and visitors to the premises. Following this he would take up a consideration of the clinical history of the individual, or of the herd, going into detail in regard to the symptoms and nature of the sickness, which should cover anything that might have occurred since the animal was first noticed to be sick by the owner, and from the time when first visited by the veterinarian. If a diagnosis is not possible after the question of symptomatology has been exhausted a postmortem examination should be made. This is practically always possible where either young pigs, shoats, or a large number are to be considered. In the case of an individual and a valuable animal this, of course, is not to be recommended until all hope of a successful treatment and recovery has been abandoned.

In holding a postmortem examination the object should be to confirm the findings of the clinical study, or in case a clinical study was not possible, or was negative, to make a diagnosis from the morbid anatomy. A correct interpretation of the lesions

found, and dependable conclusions, are possible only when made on the basis of a complete and thorough differential study. . In order to do this one must be familiar with the normal anatomy of the pig and especially with the normal color and consistency of the different organs, with the lesions characteristic of the different specific and non-specific infectious diseases; with the kinds and frequency of mixed infections, and the character of the lesions resulting from the various mixed infections as found in connection with infectious diseases; with the sporadic conditions common to the pig ;with all cases of poisoning; with all organic diseases, and their effect upon the individual; with the frequency of lesions usually chronic in nature that are common to the great majority of pigs that are apparently in perfect health; with the clinical symptoms and lesions that are associated with the different parasitic infestations, and finally with the many cases of unthriftiness and general ill health that are apparently associated with some intrinsic cause. When we come to know the outstanding characters of all the above conditions the diagnosis of diseases of swine will become much more simple, and it will not be unreasonable to expect that the veterinarian will be able to determine the condition of an individual pig with the same degree of accuracy as is common in the case of the diseases of horses and cattle. Therefore, I wish to emphasize the great necessity for an early bringing together of the facts and general knowledge of the diseases of swine as they occur under all conditions and in all classes and types of swine so that they can be put into the hands of the every-day practitioner for his guidance and use in the diagnosis, prevention, and treatment of all the diseased conditions met with in pigs, a species of animal the importance and consideration of which is the very life of the work of the veterinarian in a considerable area of our great country.

It is, of course, not to be assumed that all of the different diseases of swine will have to be taken into consideration in the case of each individual or each herd where sickness exists. It is, however, necessary in most cases to take into consideration a number of diseases the history and clinical symptoms of which are more or less the same. A few years ago the average veterinarian when consulted regarding a sick herd of pigs would have called for a pig to autopsy without making a clinical study. Today the average veterinarian will state that he desires to see the herd even after he has held a postmortem examination. For purposes of illustration, let us consider some of the diseases

common to the pig. Experience has shown (in Iowa) that in a great many cases where a number of individuals in the herd are sick it is necessary to take into consideration the following diseases: hog cholera, hemorrhagic septicemia (all forms), infectious enteritis (or necrobacillosis), pneumonia, non-specific septicemia, parasites, poisoning (from brine and stock remedies), and salmonellosis. We have at our command certain characteristic features belonging to these different diseases that are brought out by the history, development, symptoms, morbid anatomy, etiology, and, from a perspective study of individuals, but especially of the herd, the herd picture that belongs with each of these conditions. In carrying out a differential diagnosis based upon the history, symptoms, and lesions and, so far as possible, etiology one would proceed on the basis of considering the more common and prevalent disease, the disease that results in the development of a typical symptomatology and morbid anatomy and a specific etiology where such is known and is possible of demonstration.

First, let me briefly mention a few of the characteristics of these diseases. In hog cholera we have in the majority of cases a history of a herd of pigs in good flesh dying more or less suddenly. The clinical picture is high temperature, depression, loss of appetite, remaining in the nest when called for feeding, exudation from eyes, unsteady gait, a weak squeal, diarrhœa, etc., a perspective view shows some dead, others seriously sick, others only showing slight evidence of ill health, and some still apparently normal, but a large percentage of these last frequently showing a high temperature. A postmortem will reveal lesions which we have come to recognize as being characteristic of the action of hog cholera virus. These are petechial hemorrhages on the kidney, mucous membrane of the bladder, large intestine, and respiratory tract, and subserous hemorrhages of the lungs, congestion and hemorrhages of the lymph glands, and in chronic cases typical button ulcers.

In hemorrhagic septicemia (acute form) we will have a history that an animal in good flesh dies suddenly. No other animals in the herd are showing symptoms and no high temperatures will be found. In those instances where a few show symptoms it is in individuals and not a herd proposition. The symptoms are acute and of a nervous nature, running around the pen, bumping into objects or standing pushing against some object, throwing back of the head, clamping of the jaws, frothing at the mouth, etc. Morbid anatomy will be: congestion of the lymph glands, hemor-

rhages on the *thymus gland,* on the *heart,* respiratory mucous membrane, serous surface of intestine and bladder and sometimes in the lungs. It is unusual to find multiple hemorrhages on the kidney; the hemorrhagic areas in cases of acute septicemia are somewhat different in type from those met with in cholera. In cholera the characteristic hemorrhage is, barring complications, a definitely circumscribed hemorrhage area. In the case of hemorrhagic septicemia they are, as a rule, somewhat larger and irregular in outline. The distribution, however, is the more important point. A further step in the consideration of hemorrhagic septicemia is the possibility of demonstrating the microorganisms; this can be carried out by bacteriological methods and animal inoculation. In the case of mixed infection, which is not uncommon, a history of the disease, the clinical picture and the postmortem findings with the percentage of the animals affected will enable one in most cases to make a positive diagnosis.

The outstanding characteristics of infectious enteritis (necrobacillosis) are the fact that the disease comes on gradually, is most commonly encountered in shoats and especially those that have been purchased at the stock centers and shipped to the farm for feeding. The disease is characterized clinically by emaciation, absence of high temperature, good appetite at least until the latter stages of the disease, and small percentage of deaths, the losses, however, vary in different outbreaks. In those cases where a considerable number of animals die in the early stages of the disease it is due to a secondary septicemia.

The characteristic morbid anatomy of this disease is, as is well known, an inflammation of the mucous membrane of the large intestine (cecum and colon), but may in some cases involve the ileum. The well-developed lesion, or what is usually considered to be characteristic, is a necrotic or diphtheritic form of enteritis. In the beginning the mucosa of the affected portion of the bowel appears irregularly congested, reddened, swollen, and greasy. Close observation will reveal an unevenness due to desquamation of the surface cells in one part and a swollen condition of the surrounding area. The process goes on until complete desquamation of the surface cells has taken place, leaving the intestine raw, rough, granular and uneven. Inflammatory exudation continues, and there develops the characteristic necrotic, membranous, or diphtheritic exudate over all portions. Through the formation of fibrin and inflammatory changes in the underlying structures the necrotic material becomes firmly adherent, the in-

testinal wall thick and tube-like in appearance and structure, and impossible of function. The inflammatory process not infrequently involves the serous coat with more or less severe peritonitis. There is usually an absence of lesions in other organs of the body; the liver may show atrophy or it may show inflammation and degeneration as a result of secondary infection. In case we find lesions or other evidence of septicemia they can be traced to the presence of various microörganisms representing invasion of the system following the enteritis. In case lesions are found suggesting hog cholera, its presence can usually be determined from a careful clinical study or following the post-mortem examination of several pigs in the herd. Minor lesions found pointing to hog cholera should be conservatively estimated except when supported by a cholera history and clinical symptoms. Pigs that have contracted enteritis as a result of shipping and passing through stockyards, and especially if vaccinated, frequently die suddenly, show extensive lesions, non-specific septicemia and intoxication, while in cases of enteritis in herds independent of vaccination and on premises free from cholera there are few deaths except after long periods of sickness characterized by extreme emaciation. The gross pathology of the internal organs is in general that of a degenerative atrophy, indicating malnutrition. Hemorrhagic septicemia in connection with infectious enteritis is usually secondary, almost never resulting in the loss of a large number of animals, and can be diagnosed by carrying out steps for hemorrhagic septicemia.

PNEUMONIA.

Experience would seem to indicate that we have, independent of other diseases, at least four separate forms of pneumonia in the pig. First comes what I would term infectious or contagious pneumonia, very probably a pneumonic form of hemorrhagic septicemia as occurs in cattle. Second, pneumonia from the action of non-specific microörganisms that have gained entrance to the lung through conditions that can be grouped as predisposing causes, but especially in connection with poor ventilation. There are many cases on record where animals suffering from a more or less serious form of pneumonia have, following a proper ventilation of quarters, given no further trouble. Under the third division of pneumonia in pigs I would put all cases of inflammation of the lungs that are associated with other infectious diseases. Experience has shown that these conditions are common

and that upon proper control of the primary disease (Ex. hog cholera) the pneumonia will disappear from the herd. The fourth form is inflammation of the lung brought on primarily from the presence of the lung worm (Strongylus paradoxus). We sometimes find what is commonly termed nodular pneumonia, but as a result of the examination of a large number of these cases it would seem that they would come, for the present at least, under the non-specific infectious pneumonias, or may in cases be associated with the verminous pneumonia. Inflammation of the lungs in pigs is rather frequent and occurs as an independent condition having many predisposing causes, as well as a possible specific bacterial cause. It is a condition very frequently found in connection with cholera; hemorrhagic septicemia less frequently in connection with enteritis from the presence of lung worms, etc., symptoms of difficult breathing and pneumonia are not uncommon in cases of severe parasitic infestation (ascariasis) and in any condition where changes in the blood reduce its oxygen-carrying power. The first consideration in cases of individuals where symptoms and lesions of pneumonia are found would be to determine whether it was primary or secondary. If secondary to any of our infectious diseases, the handling of the herd would be on the basis of the infectious disease, the pneumonia ultimately disappearing. In the absence of other infection, or, in other words, if the pneumonia is primary and the only cause of sickness and death, relief will come in the majority of cases from a study of the conditions under which the animals are kept, and from a general elimination and correction of any or all conditions that might favor the development of pneumonia.

Non-specific septicemia of pigs is more or less common; the animal frequently dies suddenly and shows lesions of degeneration in the various organs of the body. The type of hemorrhages and their distribution is usually quite different from those seen in hog cholera, but may more or less closely resemble those of hemorrhagic septicemia; however, before decomposition sets in, the blood in the case of hemorrhagic septicemia is practically normal in appearance, while in practically every case of non-specific septicemia there is a marked hemolysis of the blood. Non-specific septicemia is further rather frequently associated with some localized lesion, abscess, etc., that plainly show the avenue of entrance. In case one is unable to make a differential diagnosis from the clinical history or morbid anatomy a bacterio-

logical examination of the blood will usually clear up any or all points.

In cases of parasitism (ascariasis) we get a herd picture of round worm infestation, a rather typical symptomatology, and, upon postmortem, the finding of the parasite completes the step necessary to make a diagnosis, *provided one is careful to make sure that no lesions of a more serious disease exist.*

POISONING, BRINE POISONING, ETC.

During the last few years cases of brine poisoning have been brought to my attention in a way which shows that this condition is not uncommon. In every instance the cause of sickness was thought to be due to cholera and has caused considerable trouble to those attempting to make a diagnosis. I would further include brine poisoning in connection with the other diseases mentioned because it tends to illustrate the importance of one's knowing and keeping in mind the possibility of cases of poisoning in connection with infectious diseases. Brine poisoning has, in my experience, come from two sources: First, those cases where animals accidently have access to salt or brine that have been used in pickling meats. Second, it comes from feeding too much salt and in most cases this salt is given in connection with stock foods and stock remedies. In most cases of brine poisoning it has been in otherwise healthy herds, and the animals have died suddenly from no apparent cause. In cases of brine poisoning from highly concentrated solution death is usually sudden and there is an absence of lesions with the exception that the carcasses do not rapidly undergo decomposition and the internal organs, liver, spleen, etc., have a firm, reddish, pickled appearance. In case of brine poisoning where the salt is acquired from eating stock foods, or drinking slop that contains a large quantity of salt, there will develop inflammatory changes in various organs of the body. In one case the outstanding lesions were nephritis and the transudation of fluid into the peritoneal and thoracic cavities. The loss of animals from acute brine poisoning is serious, and especially so at this time, and should be prevented as far as possible; but the poisoning of pigs and other live stock from the feeding of waste from biscuit factories that contains a large percentage of salt, or from the use of salvet, is criminal.

SALMONELLOSIS.

Under this heading I wish to include a condition, based on symptoms and morbid anatomy, not etiologically, that is not in-

frequently met with in pigs, the symptoms and lesions of which correspond to those reported as developing following the inoculation of pigs with the bacillus suipestifer. The symptoms are of a more or less chronic sickness, only a small percentage of the herd being affected, with slight loss of appetite, loss of flesh, depression, temperature not above 104°F., difficult breathing without the occurrence of lesions in the lungs. The lesions are enlarged dark tense friable spleen (not especially engorged with blood) and acute parenchymatous degeneration of the liver. The liver is yellowish in color, often slightly bile-stained, and the fat tissues and subcutaneous structures may show slight or marked icterus. The lymph glands are pale and abnormally juicy, and the intestinal mucosa is clean throughout. Pigs killed in the early stages show a thin, bright-red blood; if the animal has died the blood is dark, with more or less evidence of hemolysis.

In regard to the diagnosis of sporadic and organic conditions and their differentiation from the acute and chronic infectious diseases of swine we have the following to consider: Organic diseases in pigs are common; they are seldom recognized until well advanced. Death in the majority of instances takes place suddenly, and, therefore, in cases of sickness or death from any of the various organic conditions the question of a differential diagnosis always comes up. Let us take for purposes of illustration some of the more commonly encountered organic diseases that frequently terminate fatally. Diseases of the kidney, diseases of the liver, diseases of the lungs, diseases of the heart, (parasitic diseases) or any chronic inflammatory condition as found affecting the spleen, pancreas, peritoneum, etc. Of the organic diseases of the pig, inflammatory and degenerative changes in the kidney, with the exception of the lungs, are the most frequently encountered; they take on the form of acute degenerative and hemorrhagic nephritis, cystic nephritis, chronic suppurative nephritis terminating not uncommonly in hydronephrosis and chronic indurative nephritis. Our records show that a number of pigs apparently in perfect physical condition have died suddenly from the direct and indirect effect of these conditions, especially the suppurative forms of nephritis, and in every case the owners suspected cholera or some infectious condition as being the cause of death. Evidence of septicemia is not common in connection with diseases of the kidney. Inflammatory changes in the liver of the pig are common, but in my experience are not as serious as are inflammatory conditions in

the kidneys. Chronic interlobular hepatitis and multiple abscesses of the liver are frequent in the pig and are no doubt directly and indirectly the cause of death in a great many cases. Inflammation of the liver in pigs frequently terminates in septicemia. Inflammation of the lungs in its many forms and serious results is too well known to need more than mention; necrosis and abscess formation frequently characterize the final change and terminates in sudden death of the animal through septicemia or intoxication. The history and clinical picture of pneumonia usually stands out in contrast to the symptoms seen in other organic diseases; therefore, our problem is to determine whether the pneumonia is primary or secondary to some general infectious disease. Of the diseases of the heart inflammatory changes affect ing the pericardium and endocardium are frequent and serious. Pericarditis may occur as an independent condition, but is more often associated with inflammation of the lungs. Pneumo-pericarditis is a condition that results in the death of altogether too many young pigs. Of all the inflammatory diseases of the heart, vegetative endocarditis is probably the more common and occurs in every case, where we have been able to make observations, from invasion of the blood with non-specific pyogenic organisms, as a distinct primary condition, and in connection with infections following vaccination. The point of entrance is frequently obscure. This condition in pigs has to my knowledge been the cause of some extensive losses in herds. The development of the vegetative growths on the mural endocardium of the heart and valves takes place more rapidly than does the destruction of the blood from bacterial invasion; an engorged spleen is a common associated condition. The morbid anatomy of pigs dying from lesions of vegetative endocarditis resembles in many details the pathology given for swine erysipelas.

While I feel that we may well congratulate ourselves on the progress that has been made in regard to the diagnosis and control of the diseases of swine (for I am sure that we are far and away ahead, in this respect, of any country in the world), we must not be satisfied with what we have done, nor should we ignore the weak places that do exist. The information that we have and that is coming daily from the three great agencies mentioned is of the best. Our greatest need at the present time is that the great mass of valuable data furnished by the Federal and state work and the very fundamental knowledge gained by the practitioner of veterinary medicine, from his daily contact

with these conditions, should, through some concerted effort, be correlated and systematically compiled so as to make it available and comprehensive to those of the profession who are making an honest effort to cope with the problem. The medical world is still struggling with many unmastered conditions as created by nature; therefore, as a profession, we should try to impress upon every veterinarian the importance of making a careful study and record of all conditions found. We should make a special effort to search for the symptoms with the idea of developing a symptomatology for use in the diagnosis of diseases of swine that is reliable and therefore based on etiology and the morbid conditions of pigs as they are known to occur in the field today.

My plea is that we, as a profession, should direct our every effort to a more thorough understanding of the many morbid conditions common to swine, their *differentiation* and *diagnosis*, that we may be able to formulate methods both curative and preventive that will be especially directed at the particular disease; that we may prevent the many and serious losses that come from conditions other than cholera and thus make available through increased production and production at a reduced cost the many important products from the pig in quantity to supply the demand and at a price that the circumstances of the many will be able to meet.

APPENDIX.

A partial list of the infectious and organic diseases more or less commonly met with in swine:

Tuberculosis
Hog cholera
Hemorrhagic septicemia
- (a) Acute hemorrhagic septicemia
- (b) Infectious pneumonia
- (c) Cutaneous form

Infectious enteritis or necrobacillosis
Salmonellosis
Tetanus
Actinomycosis
Rabies
Non-specific septicemia
Polyarthritis
Stomatitis
Infectious rhinitis

(a) sniffles
(b) bull-nose
Pneumonia, bacterial (several forms)
Pneumonia, verminous
Poisoning (salt or brine)
Unthriftiness
Paraplegia
Scirrhous cord
Heat stroke
Infectious laryngitis
Anorexia from unpalatable food
Enteritis in young pigs from green rye pasture
Malignant œdema
Spirochætosis
Swine erysipelas
Leukemia, multiple lymphoma
Tumors
Pyobacillosis
Hernia
Peritonitis
Rachitis
Foot and mouth disease
Anthrax.

Diseases (Organic).

Nephritis
(a) acute
(b) chronic interstitial induration
(c) chronic suppurative
(d) hydronephrosis
(e) cystic nephritis
(f) parasitic nephritis
(g) toxic nephritis
cystitis
urinary calculi
Hepatitis
Acute degenerative
Acute suppurative
Chronic interlobular
Chronic focal fibrosis
Parasitic

Pneumonia
    Infectious pneumonia (several forms)
    Verminous pneumonia
Sclerodermitis
    Eczema
    Urticaria
    Erythema
    Granular eruption
Pericarditis
    Vegetative endocarditis
Inflammation of the pancreas
    Abscess of the brain
Mange
    Sarcoptic
    Demodectic
Louisness
Trichinosis
Intestinal and gastric parasites
    Stomach worm
    Ascariasis
    Œsophagastomiasis
    Trichocephalus
    Echinorhynchus gigas
Kidney worm
Liver fluke.

With three exceptions, all of the conditions mentioned in the list have been identified in Iowa during the last ten years.

EXPERIMENTS IN AVIAN TOXICOLOGY.

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It is a well-established fact that considerable variations in tolerance to drugs of a toxic nature exist in animals of different species. While these variations have been pointed out in the case of mammalian species, little information is found in toxicologic literature on the toxicity to the avian class of drugs or poisonous substances which may be of value in the treatment or control of bird diseases.

The following experiments were undertaken for the purpose of determining the toxic doses for fowls of the more commonly

used medicinal agents and of poisonous substances to which fowls not infrequently have access. No attempt was made to fix the toxic dose in certain instances where the experimental substance proved non-toxic when given in comparatively large quantities.

In each experiment, unless otherwise stated, fluids were administered directly into the esophagus or crop by means of a pipette and solids were given in gelatin capsules per os.

Medium-sized healthy mature hens weighing between 3 and 4 pounds were usually employed. Those of larger size are designated.

All doses were given while the crop contained a normal amount of food.

CONCLUSIONS.

In general, fowls may be considered as having approximately the same susceptibility to toxic substances as medium-sized dogs. They are more resistant to such substances as calomel, strychnine and tartar emetic, and less resistant to carbolic acid, salicylic acid and potassium cyanide.

In treating outbreaks of disease in fowls, it is of great advantage to employ the drinking water as a vehicle for medicinal agents. It is shown that fowls are not visibly affected by drinking solutions of bichloride of mercury 1-6000, carbolic acid 1-1000, permanganate of potash 1-500, and crude catechu 1-500 for periods of 18 to 21 days.

It is interesting to note that the crop not only serves as a reservoir for food, but that absorption through its wall is very rapid, symptoms appearing in from two to five minutes after the administration of such substances as ammonium chloride in solution, potassium cyanide and strychnine sulphate.

AMMONIUM CHLORIDE.

Lethal dose. 60 grains; 45 grains in solution (15 cc of 20% solution).

Toxic dose. Same as lethal.

Non-toxic dose. 15 to 45 grains.

EXPERIMENTS.

I.

July 8, 1918, 2 p. m. Fowl received 60 grains of ammonium chloride.

July 9. Fowl droopy, weak in legs, sitting.

July 10. Same as July 9.

July 11. Fowl died before 8 a. m.

Autopsy Notes.—No lesions were apparent.

II.

February 20, 1918, 11:05 a. m. Fowl received 45 grains of ammonium chloride in 12 cc of water (15 cc of a 20% solution).

Stimulating effect observed almost immediately. Fowl had not been very active previously. After administration of the chloride, bird began scratching energetically and singing more than the neighboring untreated fowls. Would drop wing on one side in imitation of a rooster and would crowd up against the side of the cage which separated her from another hen. Would peck at hen through the cage.

11:20 a. m. Same as above.

11:25 a. m. Drinking considerable water.

11:30 a. m. Excitement has passed.

1:00 p. m. Fowl has a sleepy appearance. Bunches up somewhat when not disturbed.

4:30 p. m. Not active. Bunched up.

February 21, 1918, 9:00 a. m. Fowl sleepy and bunched up. Stands erect, but wabbles when disturbed.

4:30 p. m. Fowl droopy. Bunched up. Feathers ruffled.

February 22. Above condition more intensified.

February 23. Fowl died before 8:00 a. m.

Autopsy Notes.—Crop filled with food. Lungs pale. Other organs apparently normal.

III.

June 25, 1918, 10:00 a. m. Fowl received 45 grains of ammonium chloride. Result: No effect was apparent.

IV.

February 28, 1918, 10:05 a. m. Fowl received 15 grains of ammonium chloride. Result: No effect was apparent.

ARSENIOUS ACID.

Lethal dose. 5 grains.

Toxic dose. 5 grains.

Non-toxic dose. 1 to 3 grains.

EXPERIMENTS.

I.

June 10, 1918, 10:00 a. m. Fowl received 5 grains of arsenious acid.

4:00 p. m. Fowl somewhat droopy. Droppings greenish.

July 11, 9:00 a. m. Fowl droopy. Droppings greenish and watery.

12:00 m. Fowl weak. Comb dark.

1:30 p. m. Fowl dead.

Autopsy Notes.—Food in crop and gizzard. Catarrhal exudate in the proventriculus. Internal membrane of the gizzard is necrosed and separated from wall at proventriculus entrance. Contents of gizzard greenish. Duodenum shows a catarrhal condition. Is pale in color. Contents of intestine are fluid and of greenish tinge. Liver is mottled. Rigor mortis is marked one hour after death.

II.

July 8, 1918, 2:00 p. m. Fowl received 3 grains of arsenious acid. Result: No effect was apparent.

III.

June 25, 1918, 10:00 a. m. Fowl received 1 grain arsenious acid. Result: No effect was apparent.

BICHLORIDE OF MERCURY.

(Mercuric Chloride, Corrosive Sublimate)

Lethal dose. 4 grains.

Toxic dose. 4 grains.

Non-toxic dose. 3 grains.

1-6000 solution as drinking water for 18 days.

EXPERIMENTS.

I.

June 10, 1918, 10:00 a. m. Fowl received 5 grains of bichloride of mercury.

10:45 a. m. Spasmodic movements of the crop for several minutes.

11:45 a. m. Droopy.

2:00 p. m. Sitting. Legs weak. Drooping.

4:00 p. m. Sitting. Cannot stand. Marked depression.

June 11, 1918, 9:00 a. m. Fowl found dead.

Autopsy Notes.—No food in crop. Gizzard filled with food. Mucous membrane of dependent portion of crop is whitened and thickened as a result of coagulation necrosis. Proventriculus shows severe catarrhal condition. Mucosa at entrance to gizzard is necrosed. Membrane of posterior portion of gizzard is sepa-

rated from the gizzard wall, the space being filled with clear fluid. Mucosa of first third of intestine is exfoliated and remainder of small intestine shows a severe catarrhal condition. Other organs apparently normal.

II.

August 12, 1918, 2:20 p. m. Four-pound fowl received 4 grains of bichloride of mercury.

4:30 p. m. No change noted.

August 13, 9:00 a. m. Legs very weak. Bird cannot walk. Sits down. Otherwise looks bright and normal.

August 14, 9:00 a. m. Fowl cannot stand.

August 15, 9:00 a. m. Fowl dead.

Autopsy Notes.—Small amount of oats in crop. Crop wall is thickened, pale, mucosa is coagulated. Subcutaneous tissue surrounding crop and esophagus is infiltrated with a greenish gelatinous exudate. Proventriculus shows several hemorrhagic points on mucosa. Gizzard contains a considerable quantity of greenish colored food. Mucosa of small intestine is pale. Kidney is very pale and studded with minute white spots. Air sac membranes in abdominal cavity are thickened. The abdominal cavity contains 6 ounces of a thick, somewhat viscid, fluid with a slight greenish tinge.

III.

February 28, 1918, 10:00 a. m. Fowl received a tablet containing 3 grains of bichloride of mercury and 3 grains of ammonium chloride. Result: No effect was apparent.

IV.

May 27, 1918, 10:00 a .m. Gave fowl 1.4 grains of bichloride of mercury in feed. Fowl had not been fed for 24 hours, crop nearly empty.

3:00 p. m. Gave fowl another 1.4 grains of bichlroide of mercury in feed. Result: No effect was apparent as a result of fowl consuming 2.8 grains of bichloride of mercury in feed in one day.

V.

June 14, 1918. Gave three fowls a 1-6000 solution of bichloride of mercury as drinking water. Fowls drank solution for a period of 18 days, consuming about 2500 cc each. No other water was given. Result: No effect was apparent.

VI.

June 12 to 14, 1918. Several fowls which had not received drinking water for 24 hours were given bichloride of mercury solutions of 1-2000 and 1-4000 as drinking water. Fowls tasted solutions and refused to drink. Solutions were clear. At intervals the solutions were again placed in the fowls' cages with the same result as above. After taking 1 to 3 swallows of solution the fowl shakes its head, rubs beak in the litter and elevates the feathers on the neck for a few moments. Gave fresh water and fowls drank eagerly.

BISMUTH SUBNITRATE.

Non-toxic dose. ¼ ounce +.

EXPERIMENT.

I.

February 20, 1918, 9:50 a. m. Fowl received ¼ ounce of bismuth subnitrate. Result: No effect was apparent.

CALCIUM OXIDE (QUICKLIME).

Toxic dose. 1¼ drams.

Non-toxic dose. ½ dram.

EXPERIMENTS.

I.

August 15, 1918, 9:40 a. m. Gave 3-pound fowl 1¼ drams of calcium oxide.

August 16. Fowl is somewhat droopy. Droppings are greenish in color.

August 17. Fowl is dull in appearance.

August 18. Fowl is dull in appearance.

August 19. Fowl appears normal.

II.

August 27, 1918, 10:30 a. m. Gave 3½-pound fowl ½ dram of calcium oxide. Result: No effect was apparent.

CALOMEL.

(Mercurous Chloride)

Non-toxic dose. 30 grains.

EXPERIMENT.

I.

February 7, 1918, 10:30 a. m. Fowl received 30 grains of calomel.

February 8, 9:00 a. m. Evidence of purging. Droppings greenish. Fowl has not been visibly affected otherwise.

CARBOLIC ACID.

Toxic dose. 5 grains in solution (11 cc of 3% solution), 3.75 grains in solution (12.5 cc of 2% solution).

Non-toxic dose. 2 grains in solution (13 cc of 1% solution). 1-1000 solution as drinking water for 18 days.

EXPERIMENTS.

I.

August 12, 1918, 2:20 p. m. Five-pound fowl received 11 cc of 3% carbolic acid solution (5 grains carbolic acid).

2:22 p. m. Crop puffed out somewhat.

3:00 p. m. Fowl has shown some droopiness since receiving the solution.

3:45 p. m. Fowl apparently normal.

4:30 p. m. Fowl apparently normal.

August 13. Fowl appears normal.

II.

February 2, 1918, 10:00 a. m. Three-pound fowl received 12.5 cc of 2% carbolic acid solution (3.75 grains carbolic acid).

11:00 a. m. Fowl shows dullness.

2:00 p. m. Fowl appears normal.

February 3. Fowl is apparently normal.

III.

August 27, 1918, 10:30 a. m. Gave four-pound fowl 13 cc of 1% carbolic acid solution (2 grains carbolic acid). Result: No effect was apparent.

IV.

June 14, 1918. Gave three fowls a 1-1000 solution of carbolic acid as drinking water for a period of 18 days. Each fowl consumed about 2500 cc. No other water was given. Result: No effect was apparent in any of the fowls.

V.

June 14, 1918. Several fowls were given carbolic acid solutions of 1-250 and 1-500 as drinking water. Fowls refused to drink the solutions. Gave fresh water and fowls drank eagerly.

CASTOR OIL.

Non-toxic dose. 6½ drams +.

EXPERIMENT.

I.

February 7, 1918, 10:30 a. m. Fowl received 6½ drams of castor oil.

February 8, 1918, 9:00 a. m. Evidence of moderate purging. Droppings greenish. Fowl was not visibly affected otherwise.

CATECHU (CRUDE).

Non-toxic dose. 1-500 solution +.

EXPERIMENT.

I.

June 10, 1918. Gave fowl a 1-500 solution of crude catechu as drinking water. Fowl drank solution freely.

July 1, 1918. Fowl drank 3000 cc of above solution in 21 days. No other water was given. No constipation was observed. No change in fowl was apparent.

CHLORIDE OF LIME.

Non-toxic dose. ¾ to 1½ drams.

EXPERIMENTS.

I.

August 15, 1918, 10:30 a. m. Five-pound fowl received 1½ drams of chloride of lime. Result: No effect was apparent.

II.

August 13, 1918, 2:30 p. m. Five-pound fowl received ¾ dram of chloride of lime. Result: No effect was apparent.

COPPER SULPHATE.

(Blue Stone)

Lethal dose. 20 grains. 15 grains in solution.

Toxic dose. Same as lethal.

Non-toxic dose. 5 to 15 grains.

EXPERIMENTS.

I.

July 8, 1918, 2:00 p. m. Fowl received 20 grains of copper sulphate.

4:00 p. m. No change apparent.

July 9. Fowl droopy. Sitting.

July 10. Fowl droopy. Sitting.

July 11, 9:00 a. m. Fowl dead.

Autopsy Notes.—Pharnyx and Œsophagus shows coagulation necrosis of the mucosa. Mucosa of crop exfoliated. Crop filled with water and greenish catarrhal exudate. Lower esophagus shows coagulation necrosis of mucosa. Proventriculus shows severe catarrhal gastritis. Catarrhal enteritis. Entire intestine is filled with greenish catarrhal exudate

II.

February 2, 1918, 10:00 a. m. Fowl received 15 grains of copper sulphate in solution (10 cc of 10% solution). Fowl drank water continuously for 15 minutes and then became restless for about three minutes.

12:00 m. Dull.

2:00 p. m. Dull.

4:30 p. m. Dull.

February 3, 1918, 9:00 a. m. Fowl is droopy.

9:30 a. m. Convulsions developed and fowl died.

Autopsy Notes.—Crop normal. Distended with water. Considerable food in crop and gizzard. Mucosa of proventriculus intensely inflamed. Horny membrane of gizzard loosened near proventriculus opening. Hemorrhagic points in submucosa. Catarrhal enteritis is quite marked. Intestine contains considerable bluish fluid. Mesenteric fat and peritoneum is petechiated. Heart is in systole.

III.

June 25, 1918, 10:00 a. m. Fowl received 15 grains of copper sulphate. Result: No effect was apparent.

IV.

February 28, 1918, 10:10 a. m. Fowl received 5 grains of copper sulphate. Result: No effect was apparent.

ERGOT, F. E.

Non-toxic dose. 2½ drams F. E. + = 2½ drams of ergot.

EXPERIMENT.

I.

February 8, 1918, 10:30 a. m. Fowl received 2½ drams of fluid extract of ergot with 2½ drams of water. Result: No effect was apparent.

FERROUS SULPHATE.

(Copperas)

Non-toxic dose. 30 grains +.

EXPERIMENT.

I.

February 7, 1918, 10:30 a. m. Fowl received 30 grains of ferrous sulphate in solution (10 cc of 20% solution). Result: No effect was apparent.

IPECAC, F. E.

Lethal dose. 1 to 2 drams.

Toxic dose. 1 dram.

Non-toxic dose. ½ to ¾ dram.

EXPERIMENTS.

I.

August 19, 1918, 1:10 p. m. Gave 4½-pound fowl 2 drams F. E. of Ipecac.

August 20. No apparent change.

August 21, 9:00 a. m. Greenish fluid droppings.

August 22, 9:00 a. m. Fowl dead.

Autopsy Notes.—Crop and gizzard filled with food. Mucosa of crop pale, slightly thickened. Lower esophagus and proventriculus showed a catarrhal condition. Several hemorrhagic points in proventriculus. Small area of internal lining of gizzard at entrance of proventriculus separated from gizzard wall. Mucosa of duodenum pale. Liver pale.

II.

August 19, 1918, 1:10 p. m. Gave 3-pound fowl 1¼ drams F. E. Ipecac.

August 20, 9:00 a. m. Fowl dead.

Autopsy Notes.—Some food in crop. Proventriculus showed a catarrhal condition. Hemorrhagic near entrance to gizzard. Membrane of gizzard easily separated near proventriculus opening. Liver is banded with light and dark stripes.

III.

August 27, 1918, 10:30 a. m. Gave 4½-pound fowl 1 dram of fluid extract of ipecac.

August 28. No change apparent.

August 29. Fowl dull.

August 30. Fowl died at 8:00 a. m.

Autopsy Notes.—Crop and gizzard filled with food. Mucosa of proventriculus thickened and catarrhal. Submucosa of gizzard near proventricular opening hemorrhagic. Liver pale in spots and streaked with darker bands. Heart in systote.

IV.

August 12, 1918, 2:20 p. m. Gave 5-pound fowl 1¼ drams F. E. Ipecac.

August 14, 9:00 a. m. Fowl has shown no change.

August 15. Somewhat dull.

August 16. Somewhat dull.

August 17. Apparently normal.

V.

August 30, 1918, 10:30 a. m. Gave 4-pound fowl ¾ dram of fluid extract of Ipecac. Result: No effect was apparent.

VI.

August 30, 1918, 10:30 a. m. Gave 4-pound fowl ½ dram of F. E. of Ipecac. Result: No effect was apparent.

LEAD OXIDE.

(Litharge)

Non-toxic dose. 1¼ drams +.

EXPERIMENT.

I.

August 15, 1918, 9:40 a. m. Five-pound fowl received 1¼ drams of lead oxide. Result: No effect was apparent.

MAGNESIUM SULPHATE.

(Epsom Salts)

Non-toxic dose. 1 dram in solution.

EXPERIMENT.

I.

February 7, 1918, 11:00 a. m. Fowl received 1 dram of Epsom salts in 4½ drams of water.

February 8, 9:00 a. m. Evidence of moderate purging. Droppings fluid and brownish. Fowl was not visibly affected otherwise.

MALE FERN, F. E.

Toxic dose. 2½ drams, F. E.

Non-toxic dose. 1¼ drams, F. E.

EXPERIMENTS.

I.

April 25, 1918, 11:15 a. m. Fowl received 2½ drams of fluid extract of male fern.

11:30 a. m. Fowl sleepy. Droopy.

11:45 a. m. Fowl sleepy. Sitting.

12:00 m. Legs very weak.

1:00 p. m. Very weak. Can raise itself on its feet with difficulty.

2:45 p. m. Sitting. Has great difficulty in attempting to stand.

4:00 p. m. Standing, but legs are still weak.

April 26, 1918, 9:00 a. m. Fowl has recovered.

II.

July 8, 1918, 2:00 p. m. Fowl received 1¼ drams of fluid extract of male fern. Result: No effect was apparent.

POTASSIUM CYANIDE.

Lethal dose. 1 to 2 grains.

Toxic dose. 1/10 to ½ grain.

EXPERIMENTS.

I.

February 20, 1918, 10:15 a. m. Gave fowl a 2-grain crystal of potassium cyanide per os. Symptoms appeared in four minutes. Fowl had difficulty in maintaining its balance. Dropped to the floor. After several minutes it fluttered around the cage for about 5 seconds, went down again, became comatose and was dead in 12 minutes after swallowing the cyanide.

II.

February 20, 10:30 a. m. Gave fowl a 1-grain crystal of potassium cyanide per os. Symptoms appeared in two minutes. Fowl became droopy, stood for several minutes with head dropped to floor (limber neck), fell to floor in a comatose state and was dead 13 minutes after swallowing the cyanide. Did not struggle at any time.

III.

July 8, 1918, 2:00 p. m. Gave fowl a ½-grain crystal of potassium cyanide per os.

2:02 p. m. Fowl jumped suddenly, striking top of cage. Stands very erect. Breathing more rapidly. Mouth open.

2:05 p. m. Unsteady on legs. Wings drooped. Distressed expression.

2:20 p. m. Fowl lying down. Continues breathing through mouth.

3:00 p. m. Same as above. Fowl can stand when forced up.
4:00 p. m. Fowl has recovered.

IV.

February 28, 10:15 a. m. Gave fowl ⅕ grain of potassium cyanide in gelatin capsule per os.
10:23 a. m. Fowl breathing rapidly through the mouth.
10:25 a. m. Wings drooping. Has attempted to pass droppings four times, each time a very small amount has been passed.
10:45 a. m. Same as above. Getting sleepy.
11:00 a. m. Same as above. Sleepy.
12:00 m. No change except that breathing is not as rapid.
1:30 p. m. Fowl has recovered.

V.

August 12, 2:23 p. m. Gave 3-pound fowl 1/10 grain potassium cyanide in small piece per os.
2:26 p. m. Breathing rapidly.
2:30 p. m. Sitting.
3:00 p. m. Has depressed appearance. Drowsy. Half sitting posture on being placed on feet. Sits again. Breathing not so rapid.
3:45 p. m. Standing. Some droopiness apparent. Breathing is normal and fowl is recovering.
4:30 p. m. Apparently normal.
August 13, 9:00 a. m. Fowl is apparently normal.

POTASSIUM PERMANGANATE.

Lethal dose. 30 grains.
Toxic dose. 30 grains.
Non-toxic dose. 15 grains. 15 grains in solution. 1-500 solution as drinking water.

EXPERIMENTS.

I.

June 25, 1918, 10:00 a. m. Gave fowl 30 grains of potassium permanganate.
4:30 p. m. No symptoms noticed.
June 26, 9:00 a. m. Fowl died during night.
Autopsy Notes.—Crop filled with oats and some water. Dependent portion of crop charred and softened. Apparently the mucous membrane was eaten through. Submucosa blackened; also skin on lower surface of crop and adjacent breast. Thick

coating of moist black material on lower mucosa of crop. Probably remains of permanganate. Several blood clots in crop. Remainder of crop mucosa normal. All other organs normal. Permanganate had not left crop as far as could be determined. Apparently hemorrhage had occurred in subcutaneous tissue and blood had been oxidized.

II.

February 2, 1918, 10:00 a. m. Gave fowl 15 grains of potassium permanganate in solution (30 cc of 3⅓% solution). Result: No effect was apparent.

III.

July 8, 2:00 p. m. Gave fowl 15 grains of potassium permanganate. Result: No effect was apparent.

IV.

June 10, 10:00 a. m. Gave fowl a 1-500 solution of potassium permanganate as drinking water. Fowl drank solution freely.

July 1. Fowl drank about 3000 cc of above solution in 21 days. No other water was given. Result: No effect was apparent.

SALICYLIC ACID.

Lethal dose. 30 to 75 grains.

Toxic dose. 30 grains.

Non-toxic dose. 15 grains.

EXPERIMENTS.

I.

June 10, 1918, 10:00 a. m. Gave fowl 75 grains of salicylic acid.

11:30 a. m. Wings dropped. Fowl sleepy. Droopy.

12:00 m. Condition growing worse.

1:30 p. m. Bird dead.

Autopsy Notes.—Crop filled with oats. No trace of the three gelatin capsules. At least half of the salicylic acid administered remains in the esophagus. Mucous membrane of mouth, esophagus, crop and lower esophagus is white from action of the salicylic acid. Protoplasm is apparently coagulated. Not so severe in lower esophagus and crop as in upper esophagus and mouth. No other lesions apparent.

II.

June 25, 1918, 10:00 a. m. Gave fowl 30 grains of salicylic acid.

4:00 p. m. Fowl droopy.

June 26, 9:00 a. m. Fowl lying on side in comatose condition.

2:30 p. m. Fowl died.

Autopsy Notes.—Crop filled with food and some white material, probably salicylic acid. Dependent portion of wall of crop thickened, wrinkled and coagulated, white in color. Mucosa of lower esophagus and proventriculus whitened. Intestine mildly hemorrhagic throughout its length. Wall congested. Liver dark, capsule thickened in one place. Spleen soft. Ovary showed B. pullorum infection.

III.

July 8, 2:00 p. m. Gave fowl 15 grains of salicylic acid. Result: No effect was apparent.

SANTONIN.

Non-toxic dose. 5 to 15 grains.

EXPERIMENTS.

I.

June 25, 10:00 a. m. Gave fowl 15 grains of santonin. Result: No effect was apparent.

II.

June 10, 10:00 a. m. Gave fowl 5 grains of santonin. Result: No effect was apparent.

SODIUM CHLORIDE.

(Common Salt)

Lethal dose. 2½ drams. 2½ drams in solution.

Toxic dose. Same as lethal.

Non-toxic dose. 1¼ to 1¾ drams.

EXPERIMENTS.

I.

February 2, 10:00 a. m. Gave fowl 2½ drams of sodium chloride in solution (40 cc of 25% sol.).

11:00 a. m. Fowl is dull.

12:00 m. Fowl is dull.

2:00 p. m. Fowl is dull. Droopy. Sleepy.

4:30 p. m. Fowl is sitting. Sleepy.

February 3, 9:00 a. m. Fowl found dead.

Autopsy Notes.—Considerable food in crop and gizzard. Crop, proventriculus and gizzard are normal. Small intestine normal. Rectum slightly inflamed. Liver darkened. Kidney congested. Heart is systole.

II.

June 25, 10:00 a. m. Gave fowl 2½ drams of sodium chloride.

June 26, 9:00 a. m. Fowl droopy.

1:00 p. m. Paralyzed.

4:00 p. m. Paralyzed. Shows condition known as wry neck.

June 27, 9:00 a. m. Paralyzed. Lying on side. Wry neck.

11:00 a. m. Died.

Autopsy Notes.—Crop gorged with food. Mucosa of crop white; cooked appearance, thickened. Severe catarrh of proventriculus; tenacious mucous exudate. Horny membrane of gizzard easily removed. Duodenum showed slight congestion. Catarrh of duodenum. Liver darkened.

III.

July 8, 2:00 p. m. Gave fowl 1¾ drams of sodium chloride. Result: No effect was apparent.

IV.

February 28, 10:00 a. m. Gave fowl 1¼ drams of sodium chloride.

10:30 a. m. Fowl shows a moderate thirst. Results: No effects were apparent.

SODIUM NITRATE.

Lethal dose. 2½ drams.

Toxic dose. 1¼ drams.

Non-toxic dose. ½ dram.

EXPERIMENTS.

I.

February 20, 9:50 a. m. Gave fowl 2½ drams of sodium nitrate.

11:00 a. m. Fowl dull and droopy.

12:00 m. Fowl shows increased dullness, droopiness and sleepiness. Sitting.

1:00 p. m. Fowl is wideawake but dull. Is in a sitting posture. Legs paralyzed, cannot stand.

3:00 p. m. Fowl lying on its side, cannot move, legs paralyzed. Greatly depressed. Death appears imminent.

4:30 p. m. No change from above.

February 21, 9:00 a. m. Fowl died during night.

Autopsy Notes.—Crop wall and skin covering it dehydrated. These membranes were transparent, dry and tough. Proventriculus shows severe catarrhal exudate. Inner membrane of gizzard separated from submucosa. Considerable fluid beneath inner membrane. Catarrhal enteritis. Duodenal mucosa congested somewhat. Liver dark. Spleen pale. Pancreas enlarged and infiltrated. Heart in systole. Considerable food in crop.

II.

February 28, 1918, 10:00 a. m. Gave fowl 1¼ drams of sodium nitrate.

1:30 p. m. No change is apparent.

3:30 p. m. Fowl bunched up and sleeping. On being aroused displays marked thirst. Becomes droopy and sleepy again.

4:30 p. m. Fowl droopy and shows thirst.

March 1, 9:00 a. m. Fowl quiet. Sits down. Comb and wattles dark red.

12:00 m. Same as above.

1:30 p. m. Fowl paralyzed, no use of feet, prostrated.

3:30 p. m. Same as above. Comb blackening at the tips.

4:30 p. m. Same.

March 2, 9:00 a. m. Fowl up, normal in appearance but quiet on being handled. Comb a bright red.

3:00 p. m. Fowl apparently normal.

III.

June 25, 10:00 a. m. Gave fowl ½ dram of sodium nitrate. Result. No effect was apparent.

STRYCHNINE SULPHATE.

Lethal dose. 2 grains to 3½-pound fowl.

Toxic dose. 2 to 3 grains to 5-pound fowl. 1.5 grains to 3-pound fowl. 8 cc F. E. nux vomica = 1.2 grains to 3-pound fowl.

Non-toxic dose. 2 grains to 5-pound fowl.

EXPERIMENTS.

I.

August 12, 2:22 p. m. Gave 3½-pound fowl 2 grains of strychnine sulphate in gelatin capsule per os.

2:30 p. m. Breathing more rapidly. Some unsteadiness of legs.

2:31 p. m. Convulsion lasting ten seconds. Fowl down on side.

2:32 p. m. Slight convulsion. Rapid breathing.

2:35 p. m. Slight convulsion.

2:36 p. m. Fowl stretched out at length. Rapid shivering of legs.

2:40 p. m. Fowl dead.

Autopsy Notes.—Fowl stiff. Considerable fluid in crop. Heart in systole. Liver slightly congested. Comb, wattles and face darkened.

II.

August 12, 2:23 p. m. Gave 5-pound fowl 3 grains of strychnine sulphate in gelatin capsule per os.

2:45 p. m. Breathing rapidly. Unsteady on legs.

2:50 p. m. Sitting.

2:55 p. m. Standing. Breathing 180 per minute.

3:45 p. m. Breathing considerably decreased. Some unsteadiness on legs through lack of normal powers of balance.

4:30 p. m. Appears improved.

August 13, 9:00 a. m. Fowl's legs straddled. Cannot stand up. When disturbed clonic spasms lasting 4 or 5 seconds are set up.

August 14, 9:00 a. m. Fowl paralyzed.

August 15, 9:00 a. m. Fowl stands fairly erect for a short time, but is unsteady on its feet. Diarrhœa present.

August 16. Fowl stands, but is unsteady on feet. Much improved.

August 17, 9:00 a. m. Fowl appears normal.

III.

July 8, 1:55 p. m. Gave 5-pound fowl 2 grains of strychnine in gelatin capsule per os.

2:10 p. m. Fowl unsteady on feet.

2:15 p. m. Sways over backwards. Weak in legs.

4:00 p. m. No other change observed. Fowl apparently normal.

IV.

February 19, 2:10 p. m. Gave fowl 1.5 grains of strychnine sulphate in gelatin capsule per os.

2:30 p. m. Fowl suddenly affected. Delay due to slowness of liquefaction of the capsule. Fowl staggers, legs spread, bird drops on her side. Several severe spasms in first 5 minutes, breathing rapidly.

2:40 p. m. Fowl sleepy, dozes for a moment and then starts suddenly, breathing rapidly; no spasms.

3:00 p. m. Breathing less labored, fowl still prostrated.

4:00 p. m. Bird in sitting position. Can rise slightly from the floor, but cannot stand erect. Breathing normal and fowl appears bright and normal other than the leg weakness.

February 20, 9:00 a. m. Fowl is apparently normal except for incoördination of movement. Unsteady on its feet and lifts them higher than normal in walking.

February 21. Fowl improving in ability to control legs, but still unsteady.

February 23. Fowl apparently normal.

V.

February 8, 10:30 a. m. Gave fowl 8 cc of fluid extract of nux vomica (1% strychnine) with 8 cc of H_2O by tube into crop = 1.2 grains of strychnine.

10:35 a. m. Fowl nervous. Breathing very rapidly.

10:40 a. m. Fowl wabbles, difficult to maintain balance, legs weak, bird does not stand erect. Severe spasm of muscles of body and wings lasting 10 seconds.

10:50 a. m. Fowl in sitting position from leg weakness or partial paralysis, breathing rapidly. Has had three violent convulsions. Comb and wattles redder than normal.

11:00 a. m. Breathing much slower. No more spasms. Bird is recovering.

11:30 a. m. Fowl can stand.

12:00 m. Fowl appears normal.

4:30 p. m. Fowl normal.

VI.

June 25, 10:00 a. m. Gave 5-pound fowl 2 grains of strychnine in gelatin capsule per os. No effect apparent except a slight increase in activity for several moments one nour after administration.

SULPHUR.

Non-toxic dose. ¼ ounce +.

EXPERIMENT.

I.

February 20, 9:45 a. m. Fowl received ¼ ounce of sulphur. Result: No effect was apparent. Fowl remained as active as it was previous to administration of the sulphur.

TARTAR EMETIC.

Lethal dose. 10 to 15 grains.

Toxic dose. 10 grains.

Non-toxic dose. 5 grains.

EXPERIMENTS.

I.

February 20, 9:40 a. m. Gave fowl 15 grains of tartar emetic.

12:00 m. No special change except that the bird is quieter than normal.

1:00 p. m. Bird quieter than normal. Sits down a good deal.

4:30 p. m. Quiet but shows no special symptoms.

February 21, 9:00 a. m. Fowl died during the night.

Autopsy Notes.—Comb normal. Heart in systole. Crop contains considerable food. Proventriculus shows catarrhal condition. Intestine catarrhal. Duodenum petechiated. Heart petechiated. Liver pale. Kidneys congested.

II.

June 25, 10:00 a. m. Gave fowl 10 grains tartar emetic.

June 26. No apparent change.

June 27. No apparent change.

June 28, 9:00 a. m. Fowl dead.

Autopsy Notes.—Considerable food in crop. Mucosa of dependent portion of crop shows a number of small necrotic patches and erosions. Mucosa of duodenum hemorrhagic. Liver congested in spots, pale in spots. Heart in systole.

III.

February 28, 10:15 a. m. Fowl received 5 grains of tartar emetic. Result: No effect was apparent.

TURPENTINE.

Non-toxic dose. 2½ drams +.

EXPERIMENT.

I.

February 7, 10:30 a. m. Fowl received 2½ drams of turpentine with 2½ drams of linseed oil. Result: No effect was apparent.

THE METHOD OF THE BUREAU OF ANIMAL INDUSTRY FOR TESTING THE POTENCY OF TUBERCULIN.

E. C. SCHROEDER, M. D. V., and G. W. BRETT, D. V. M.,
Bureau of Animal Industry Experiment Station.

The frequency with which tuberculous cattle fail to manifest symptoms of disease until long after they have become dangerous disseminators of tubercle bacilli, and the measure in which the control and eradication of tuberculosis among animals depend upon a reliable means of diagnosing the disease, and the extent to which diagnosis depends upon the use of tuberculin, make it eminently desirable that the tuberculin sold under government licenses should be tested periodically to insure its potency and purity.

Recognizing the truth of the above statement, the Experiment Station of the Bureau of Animal Industry undertook a number of years ago to make periodic tests of commercial tuberculin. These tests soon revealed that some of the tuberculin obtainable from regular dealers was greatly lacking in potency, and that the standardization of tuberculin was a problem which presented a number of difficulties.

Experimental work, in which various species of animals were used, was at once undertaken, which led to the adoption of the following described test, now currently used at the Station.

The test is based on the toxicity of tuberculin for tuberculous animals, and is a modification of the standardization test originally defined and used by Koch, the discoverer of the tubercle bacillus and of tuberculin.

Guinea pigs, practically alike in size, age, weight, variety, etc., are infected with tuberculosis through the subcutaneous injection of tuberculous material.

The tuberculous material used is prepared as follows: A small amount of fresh tuberculous tissue from a tuberculous guinea pig (from 2 to 3 grams) is triturated with a sufficient volume of sterile, distilled water to make a smooth, semi-fluid paste. The paste is then thoroughly mixed with 150 to 200 cc of sterile, distilled water and the resulting suspension filtered through ordinary filter paper. The filtrate is used to inject the guinea pigs, and the dose is determined by the approximate abundance of

tubercle bacilli it contains. If, for instance, the microscopic examination of cover-glass preparations of the filtrate shows one tubercle bacillus in each field, one-quarter of a cubic centimeter is regarded as a sufficient dose; if only one or two tubercle bacilli are found on each cover-glass, a dose of one-half cubic centimeter is used.

At the Experiment Station we prefer material of the kind above described for infecting guinea pigs with tuberculosis because it contains a more even distribution of tubercle bacilli than a suspension made with a pure culture. In suspension made with pure cultures it is practically impossible to get rid of clumps of tubercle bacilli, which, though they may be small enough to require magnification to be visible, are found on microscopic examination to be composed of numerous germs. In the diluted tissue emulsion the germs are well separated; only occasionally groups of two or three are seen; hence, any portion of the material is very likely to be practically as infectious as any other equal portion.

Further, as it requires only a very minute amount of a foreign protein to anaphylactically sensitize guinea pigs, the infection of guinea pigs with tuberculous tissue from guinea pigs eliminates the errors which might arise from a sensitization to a foreign protein contained in the culture media on which tubercle bacilli are grown.

Two points in the infection of the guinea pigs are kept in mind: first, the equal exposure of all the guinea pigs, and, second, that the exposure shall be sufficient but not excessive.

Beginning about three weeks after the guinea pigs have been infected, tests are made to determine the degree of sensitiveness to tuberculin which has developed. Two guinea pigs are injected, intraäbdominally, one with the equivalent of one cattle dose of tuberculin per 500 grams of its weight and the other with the equivalent of one and one-half cattle doses per 500 grams of its weight. (The term cattle dose signifies the dose of tuberculin recommended for diagnosing tuberculosis in an adult bovine animal of average weight.)

If both guinea pigs survive, several days are allowed to pass and the same test is repeated on two more guinea pigs. If the guinea pig which received the larger dose died and the one which received the smaller dose survived, two guinea pigs are injected daily with the smaller dose until the sensitiveness to tuberculin has developed sufficiently for both to die within a period of

twenty-four hours. Following this day six guinea pigs are given each the equivalent of one cattle dose of tuberculin per 500 grams of weight, and if not less than four of the six die within twenty-four hours the remaining guinea pigs of the number originally infected with tuberculosis are regarded as ready for use on the next day, on which the procedure is as follows:

As many groups of six guinea pigs each, plus one additional group, are taken as there are samples of tuberculin to test, and to each group two normal, healthy guinea pigs are added. Each group is used for one sample of tuberculin and each guinea pig is injected, intraäbdominally, with one cattle dose of tuberculin per 500 grams of its weight.

(The dose is carefully measured, as, for example, a guinea pig which weighs just 500 grams receives one cattle dose of tuberculin, or precisely the dose recommended by the manufacturers for testing a bovine animal of average size. Should the guinea pig weigh 600 grams, the dose would be 600/500 of one cattle dose, or 1.2 cattle doses; should it weigh 400 grams, the dose would be 400/500 of one cattle dose, or 0.8 cattle dose.)

To determine the sensitiveness of the tuberculous guinea pigs a Bureau of Animal Industry tuberculin is used, which, in a previous test, proved to be of reliable potency.

The plus group of guinea pigs is injected with Bureau of Animal Industry tuberculin of presumably known potency, and is provisionally taken as a standard of comparison.

Now, if the tuberculin which is provisionally taken as the standard kills not less than two-thirds of the sensitized guinea pigs injected with it before the lapse of twenty-four hours, and the two normal guinea pigs injected with it remain free from symptoms of disease excepting the rapidly passing distress which may immediately follow the injection, it is required that any other sample of tuberculin, if it possesses a reliable degree of potency, should kill, within twenty-four hours, at least half the sensitized guinea pigs injected with it, and that the normal guinea pigs injected with it should be alive and well at the end of twenty-four hours.

All guinea pigs that die must show, on autopsy, the characteristic lesions found when tuberculous animals die as the result of an injection of tuberculin.

The normal guinea pigs, after the potency tests are completed, are held under observation a sufficient length of time for tuberculosis to develop in the case the tuberculin with which they were

injected happened to be contaminated with living tubercle bacilli.

If any sample of tuberculin in the tests fails to show sufficient potency, or seems to contain extraneous substances which are harmful to healthy guinea pigs, additional tests are at once made to confirm the original test and to measure the degree of trouble, and it is only after the latter tests are completed that the Experiment Station reports to the Chief of the Bureau of Animal Industry and recommends such action as may be desirable.

As it would not be fair to accept the Bureau of Animal Industry tuberculin or any other test without further consideration, as an absolute standard, although the Bureau tuberculin with numerous and varied tests has never failed to prove satisfactory, it is used provisionally only. It is not recognized as a satisfactory standard until a test in which six to eight other samples of tuberculin are also concerned proves that its potency is neither greater nor lower than the average potency of the six to eight other samples. For example, if it was found that the Bureau tuberculin was the only one among six to eight samples which invariably killed all the sensitized guinea pigs injected with it, it would be necessary at once to assume that it was superpotent. On the other hand, if the average number of deaths caused by the other samples exceeded the proportion of deaths caused by the Bureau tuberculin, the only just conclusion would be that the Bureau product was sub-potent.

It may prove interesting to know that healthy guinea pigs tolerate intraäbdominal injections of from two to two and one-half cattle doses of tuberculin per 500 grams of weight. Following inoculations with tuberculosis, the first evidence of developing sensitiveness to tuberculin can be detected, as a rule, on the twelfth day. After the twelfth day the sensitiveness increases with varying rapidity. The interval of time between the first determinable sensitiveness and that degree through which one cattle dose of tuberculin per 500 grams of guinea pig is fatal varies from ten to twenty-three days. In other words, the guinea pigs the Station uses in its tuberculin potency tests may be at the precisely required stage of sensitiveness as early as twenty-two days, or not until as late as thirty-five days, after they have been inoculated with tuberculosis. The average length of time is twenty-nine days.

Sensitiveness continues to increase after one cattle dose of tuberculin per 500 grams weight of guinea pig has become fatal, so that, for example, fifty days after guinea pigs have been

inoculated with tuberculosis one-eighth cattle dose of tuberculin may prove fatal in less than twenty-four hours.

The use of the guinea pigs in practical tests on the day when one cattle dose of tuberculin causes death within twenty-four hours has a double advantage: Tuberculous lesions are sufficiently developed for the easy observation on postmortem examination of the conditions peculiar to such lesions in animals that have died of tuberculin anaphylaxis, and the disease has not progressed to a stage at which it, in combination with the shock due to handling and an intraäbdominal injection, may cause frequent deaths not certainly attributable to the toxic properties of tuberculin for tuberculous animals.

There are several companies that invariably produce a tuberculin from 10% to 25% more potent than Bureau tuberculin; also, there are several companies that produce tuberculin which frequently ranges from 25% to 75% below the potency of Bureau tuberculin. The super-potent tuberculin, provided it does not injure healthy guinea pigs injected with it, is the kind that merits special commendation, because, within reasonable or economic limits, it is hardly possible to produce a tuberculin too strong to defeat satisfactory results when it is used as a diagnostic agent for cattle tuberculosis. Cattle that are free from tuberculosis do not react with tuberculin and are not sensibly injured by it, though they receive doses five, or even ten, times as large as the dose required to cause a good reaction in a tuberculous animal. On the other hand, a dose of tuberculin greatly in excess of the necessary amount has no tendency to defeat the occurrence of a reaction in a tuberculous animal.

The slightly greater expenditure required to produce a tuberculin which, if its potency varies at all, does so from normal to super-normal, than to produce a tuberculin which varies from normal to sub-normal, is so small when compared with the losses and disappointments which may follow the use of a tuberculin of sub-normal potency in only a few herds of cattle, that the higher grade should be the constant standard of all manufacturers.

The fire destroying the veterinary hospital and all its contents of Dr. George Cohen on East Twenty-third Street also destroyed all the anatomical equipment of the New York State Veterinary College. Temporary quarters in Twenty-fourth Street at Fiss, Doerr & Carroll's were immediately equipped for the students.

PRESENTATION OF PORTRAITS OF DRS. SALMON, MELVIN AND MOHLER TO THE A. V. M. A. AT THE PHILADELPHIA MEETING.

Address by R. F. EAGLE, Chicago, Illinois.

To the Officers and Members of the
American Veterinary Medical Association:

The index to the dial of veterinary progress continues to point forward. Few, if any, of the sciences have shown the rapid progress that has marked veterinary advancement during the past decade. Time will not permit a review of the many achievements of veterinary science in the interest of hygiene and agriculture, yet suffice it to say that the profession is recognized as truly scientific and indispensable in its economic importance to the general welfare of a progressive citizenship.

The advancement of and recognition now given veterinary science are the result of conscientious effort on the part of either the individual veterinarian or the various veterinary institutions to attain those standards in education and ethics that have been established by this Association. Each veterinarian should at all times feel that his vocation is an honorable one, carrying with it a social standing, the dignity of which will be measured by the attainments of the individual since the profession has already established itself in this connection.

During the development of veterinary science in America not only the profession but its individual members have been greatly dignified by special recognition given numerous members of the profession in view of their valuable scientific and practical contributions to agriculture and hygiene. We find that veterinarians in addition to proving their ability in veterinary lines have also shown exceptional ability in organization, direction and administration. Especially is this true in many avenues of the commercial world. Our profession enlists among its illustrious dead men who, during their lives, possessed exceptional scientific ability and whose personal service given to the further development of veterinary science has caused them to become immortal in the influence that shall live after them. The profession also proudly points to numerous of its members who have survived the illustrious dead as men who are devoting their life's work

to raising the standard of the profession, and many of them have given to the world scientific contributions which have played an important role in the onward march of civilization.

Agriculture and hygiene owe a great deal to such scientific achievements, yet we regret that up to date our profession has not perhaps gone as far as was possible in establishing material tokens in honor of our distinguished members, be they either among the illustrious dead or those that survive them.

It is for the purpose of starting a movement of this kind that I appear before you today, especially since an opportunity has presented itself to honor those that have distinguished themselves in our profession. During the month of December, 1917, I had the privilege of attending a joint session of the United States Live Stock Sanitary Association and officers of the various pure breed associations and the packing industries, which session was called to give consideration to the plan of the United States Bureau of Animal Industry for the establishment of tuberculosis-free accredited herds. The meeting was held in the Saddle and Sirloin Club at the Union Stock Yards, Chicago, Ill., which stock yards, as you know, is the largest live stock market in the world. Among the many beautiful and interesting features and appointments of the Saddle and Sirloin Club is the art gallery, the walls of which are dedicated as a permanent place for the portraits of those whose contributions to the live stock industry entitle them to be thus honored.

While visiting this gallery in company with Dr. V. A. Moore, of Cornell University, Ithaca, N. Y., we were somewhat surprised to note that the veterinary profession had not yet been honored with a portrait of a distinguished member. Dr. Moore and myself at once concluded if the rules of the Saddle and Sirloin Club would permit some plan should be evolved that would result in honoring the memory of Dr. Daniel Elmer Salmon, who not only was distinguished as the first Chief of the United States Bureau of Animal Industry but was also considered a veterinarian of exceptional scientific attainments. Dr. Moore and I appointed ourselves as a committee to investigate the possibilities in this connection and as I am a resident of Chicago it was agreed that I personally follow this matter to a definite conclusion. The possibility of honoring a veterinarian in this manner was first referred to Mr. R. B. Ogilvie, Secretary of the American Clydesdale Association, who is also a member of the Art Committee of the Saddle and Sirloin Club. Mr. Ogilvie was very much im-

pressed with the plan, which, in his opinion, opened a very desirable medium by which the profession would not only be further dignified but, equally important, the establishment of a veterinary gallery in connection with the present gallery of the Saddle and Sirloin Club would result in not only bringing to a common meeting ground the producers of live stock and meats but also those upon whom the country must depend for the conservation of same—namely, the veterinarian. Such a pleasant status should be most desirable and result in a closer coöperative spirit existing between members of our profession and the live stock producers.

Mr. Ogilvie is entitled to not only the appreciation of the entire profession but, further, the greatest commendation for his deep interest and untiring efforts in assisting in the creation of a veterinary gallery in connection with the Saddle and Sirloin Club. Such a gallery will undoubtedly become historic through its influence in developing a more decided fraternal feeling between live stock producers and veterinarians. The interests of the two are in common, and it is essential to the scientific success of both that they better know one another. The creation of this gallery should serve to greatly stimulate the activities among the members of our profession in an effort to gain the same honor and recognition as those whose portraits are now a part of the gallery. Both the profession and the live stock industry will greatly profit by such increased activities.

It might be said for the information of the Association that the Art Gallery of the Saddle and Sirloin Club at Chicago is not only the largest of its kind but the best in the world. Among the membership of the Saddle and Sirloin Club are those directly interested in the breeding and raising of all species of live stock and the production of meats.

Immediately following the receipt of a letter from Mr. A. G. Leonard, Chairman of the Art Committee of the Saddle and Sirloin Club and President of the Union Stock Yards, and also Mr. R. B. Ogilvie, who advised me that the club would favor the acceptance of portraits of distinguished members of the profession, the name of Dr. Daniel Elmer Salmon was submitted. This same committee advised that the portrait of one who for so many years was a faithful and efficient officer of the Department of Agriculture at Washington would be very acceptable. The question then presented itself as to how best obtain the funds for procuring the portrait of Dr. Salmon. In conversation with

Mr. Thomas E. Wilson, President of Wilson & Co., who is also a member of the Saddle and Sirloin Club and a breeder of pure bred cattle, horses and swine, he informed me that in his opinion the plan as outlined for honoring the memory of distinguished members of our profession was one which he personally felt would result in a great amount of good to both the live stock industry and the veterinary profession in America.

Mr. Wilson's high regard for the scientific veterinarian and his further appreciation of his value in connection with the conservation of our live stock and meat industries caused him to take a keen personal interest in the plan for honoring distinguished members of our profession, and when the question of financial assistance was presented to him for the purpose of obtaining a portrait of Dr. Daniel Elmer Salmon, Mr. Wilson immediately volunteered to contribute a fund which he desired to be used as a basis for the establishment of a veterinary gallery in connection with the Saddle and Sirloin Club. A portrait of Dr. Daniel Elmer Salmon, who was Chief of the Bureau of Animal Industry from the time of its establishment in 1884 until 1905, was immediately ordered.

Dr. Salmon was born at Mount Olive, N. J., July 23, 1850. Entering Cornell University in 1868 as a member of its first freshman class, he was graduated in 1872 with the degree of Bachelor of Veterinary Science, having attended a veterinary course in Paris the last six months of his course.

After practicing his profession in New Jersey and North Carolina, Dr. Salmon, in 1883, was called to Washington by Commissioner Loring to establish a veterinary division in the Department of Agriculture. When the Bureau of Animal Industry was created by Congress, Dr. Salmon was appointed Chief of it, a position which he held continuously for twenty years. Among the many important works accomplished during his régime may be mentioned the establishment of the federal meat inspection service, the complete eradication of contagious pleuropneumonia of cattle from the United States, the preservation of the country from imported diseases by perfecting a system of inspecting and quarantining imported animals and the scientific investigation of all animal diseases and their bearing upon public health questions.

Following his service with this government, Dr. Salmon was employed by the government of Uruguay. Later he came back to the United States and was engaged in special veterinary work

in the West. He died at Butte, Mont., on August 30, 1914. Kindly in heart, generous in nature, forbearing in spirit to all men, his life was filled with great achievements for his profession that added to the world's progress and wealth and for which he sought no vain glory.

He was an honorary associate of the Royal College of Veterinary Surgeons of Great Britain, fellow of the American Association for the Advancement of Science, member of the Cornell Alumni Association of Washington, chairman of the committee on animal diseases and animal food of the American Public Health Association, ex-president of the American Veterinary Medical Association, member of the Washington Academy of Science and of various other bodies devoted to medical and general science. His writings on these subjects have been published in many languages.

It is indeed a great honor to present to this Association the portrait in memory of such a distinguished member of the profession as Dr. Daniel Elmer Salmon.

Before the artist had completed the painting of Dr. Salmon's portrait our profession was shocked by the news of the sudden death of Dr. Alonzo Dorus Melvin, second Chief of the United States Bureau of Animal Industry. This news immediately suggested to the committee having in charge the fund contributed by Mr. Wilson that it would meet with the general approval of the profession to suggest the name of Dr. Melvin as the second veterinarian to be honored in this manner.

Dr. Melvin was born at Sterling, Ill., October 28, 1862, and was given the degree of Doctor of Veterinary Surgery by the Chicago Veterinary College in 1886. His service with the Bureau dates back to the year of his graduation, which was almost coincident with the organization of the Bureau in 1884. His first work was in connection with the eradication of pleuro-pneumonia of cattle. In 1890 he was sent to England and stationed at Liverpool to investigate and report upon various phases of the, then, large export trade in live stock from the United States. Upon his return in 1892 he was placed in charge of the federal meat inspection at Chicago. In 1895 he was transferred to Washington and made Chief of the Inspection Division, which at that time included the quarantine work, the eradication of contagious diseases of animals, etc. In 1899 he was made Assistant Chief of the Bureau, and on December 1, 1905, succeeded the late Dr. Salmon as Chief of the Bureau.

During the twelve years of Dr. Melvin's incumbency as Chief the work of the Bureau of Animal Industry has expanded very greatly, and the duties of administration have in consequence become increasingly onerous.

The services of Dr. Melvin that perhaps made him best known to the public were in connection with the last two outbreaks of foot-and-mouth disease in 1908 and 1914, both of which were stamped out under his energetic and effective leadership. His services have also been marked by the eradication of the cattle fever tick from 51 % of a great extent of southern territory quarantined in 1906. In his term of office the present meat inspection law and similar laws looking to the betterment of the live stock industry, all of which were advocated by Dr. Melvin, were enacted by Congress.

In addition to his administrative duties he found time to publish a number of important publications on meat inspection, foot-and-mouth disease, bovine tuberculosis, and the South American meat industry.

Outside of his official position, Dr. Melvin was prominent in veterinary and scientific organizations. Among these may be mentioned the American Veterinary Medical Association, of which he was elected president in 1909. He was an honorary associate of the Royal College of Veterinary Surgeons, London, England, and was a member of the advisory board of the Hygienic Laboratory of the United States Public Health Service.

The offices which he held came to him because of the recognition of his eminent fitness for the duties by virtue of his talents, his wide experience and his devotion to duty. His progress to the highest office in the Bureau was a reward for an unusual accuracy and trustworthiness and a personality as strong and sincere as it was gentle. His long and loyal service was distinguished by his courtesy and fairness in his official dealings and by his uniform kindliness and equability in all his personal relations.

The remarkable progress of the Bureau during his administration, its achievements in the development and safeguarding of an industry so vitally important to the welfare of the nation as the live stock industry, the advances made toward a more complete protection of the public health from the menaces of communicable animal diseases and the important results of scientific research carried on under his direction, altogether form an enduring monument to his memory more impressive than

any other to those who can see and understand what has been accomplished through his efforts. The beneficence of his distinguished public service will not cease with his going. Moreover, the example of his unselfish devotion to his work for the good of humanity will continue to serve as an inspiration to those who remain to labor in the same field of endeavor. In a more personal way he will always be affectionately remembered as a large-hearted, patient man, kindly, considerate, appreciative of the work of his subordinates, who not only respected and admired him as their chief but loved him as their friend.

It is, in our opinion, an added honor not only to the profession but to the memory of Dr. Melvin to be able to present to the Association the portrait of this distinguished gentleman.

Immediately following the decision to select the portrait of Dr. Melvin I received a letter over the signatures of Messrs. A. G. Leonard and R. B. Ogilvie in which they stated:

> "We do not believe in waiting until our friends pass over the silent river to give an expression of our appreciation of the value of their citizenship and services in whatever field they may have labored. It is commendable to pay just tribute to the memory of the dead, and it is always timely and wise to give some evidences of our appreciation of the value and worth incident to a distinguished citizenship to the living. For this reason we would gladly accept not only the portraits of Dr. Salmon and Dr. Melvin, but also one of Dr. Mohler, whose professional attainments entitle him to be ranked as the most distinguished living member of his profession in the United States. Believing that our action in giving the portraits of the persons named a companionship with our immortals, and their survivors, might unite the members of the veterinary profession in an effort to place their calling on a higher plane than it has hitherto occupied in this country, we will in the future be pleased to receive portraits of any member of your profession whose achievements may entitle him to this distinction."

In view of this, and the recommendation of Mr. Ogilvie of the American Clydesdale Association, the committee unanimously agreed to show appreciation of Dr. Mohler's contributions to the profession and the live stock industry by selecting his portrait

to be the third to be hung in the gallery and the first portrait of any living veterinarian.

The country is fortunate in having as the successor to such able men as D. E. Salmon and A. D. Melvin at the head of the National Bureau of Animal Industry a man so well qualified for that important post as John Robbins Mohler. In education and experience, in talent and in temperament, in scientific knowledge and its practical application, and in general administrative ability, Dr. Mohler combines in a rare degree the qualities needed in such a position.

His professional education was acquired in the veterinary department of the University of Pennsylvania in his native city of Philadelphia. After a brief period of veterinary practice he entered the service of the Bureau of Animal Industry, where in the course of twenty years he has undergone varied experience and training which have helped to fit him to head the organization. First he was assigned to the live stock inspection service in connection with the quarantine for tick fever of cattle and the importation of animals from Mexico, and was stationed in Texas, New Mexico and California. Later he was tranasferred to meat inspection and served at Kansas City and Milwaukee. While at the latter place he attended the Medical College of Marquette University for two years. His taste for scientific research led to his transfer to the Pathological Division of the Bureau at Washington. There he rose to be Assistant Chief and later Chief of that Division. After several years he became Assistant Chief of the Bureau under Dr. Melvin. In that position he had a large part in the executive affairs, and during the period of Dr. Melvin's failing health the direction of the Bureau's work devolved upon him to an increasing extent. So when Dr. Melvin passed away the Secretary of Agriculture did the logical thing in appointing Dr. Mohler Chief of the Bureau.

In the science of animal pathology Dr. Mohler has done some notable work which deserves to be recounted here. His first important work of this kind was in clearing up the etiology of a disease of sheep which he named caseous lymph-adenitis, an affection which, up to that time, had been confused with tuberculosis and actinomycosis in meat inspection. He discovered a new fusarium as the causal agent of dermal mycosis of horses, and determined that the necrophorus bacillus was the causal factor of such diseases as foot rot in sheep, anovulvitis, necrotic dermatitis, etc. He discovered the microörganism of a new dis-

ease of goats, which disease was named takosis, and also discovered the causal agent of apoplectiform septicemia, a new disease of chickens. He found the infection of surra in an importation of cattle brought to this country from India, and this discovery prevented the introduction of that oriental pest into the United States. He also discovered the trypanosome of dourine in horses in this country, thereby identifying and connecting this animal venereal disease in the United States with the one existing in Europe. He devised an apparatus by which sterile air could be used in the treatment of milk fever of cows. His discovery of the low potency of tetanus antitoxin as found on the market led to the law placing veterinary biological products under the supervision of the Bureau.

In the various outbreaks of foot-and-mouth disease in the United States he has done valuable work. In 1902 he confirmed the diagnosis of the malady. In the 1908 outbreak by a brillant piece of what may be termed scientific detective work he definitely traced the source of the infection to a strain of contaminated smallpox vaccine that had been imported some time before. At the time of the third outbreak in 1914-15, although engaged in administrative work, he devoted considerable time to making investigations which resulted in the discovery that the virus of foot-and-mouth disease will live for a long time in phenolized hog-cholera serum. One of his most recent achievements is his work on vesicular stomatitis in differentiating this infection from foot-and-mouth disease.

In the practical application of scientific results no less than in original research Dr. Mohler has shown talent and vision. He has labored not so much to make discoveries in pure science as to gain knowledge needed in meeting actual problems and bringing about practical benefits. He was quick to see the possibility and the benefits of utilizing the knowledge of the life history of the southern cattle tick so as to bring about the extermination of this pest, and he was the first member of the staff of the Department of Agriculture to regard such an undertaking as feasible.

As a writer Dr. Mohler is gifted with a clear and fluent style. A long list of literature, some technical and some popular, stands to his credit. Besides original work, he has made English translations of valuable foreign treatises. His popular writings show that he knows how to place useful knowledge before the ordinary stockman and farmer, and that he has no fear of sacrificing scientific dignity in so doing.

Dr. Mohler's activities have not been confined to the Bureau in which he is employed and his popularity with veterinary and other scientific bodies is evidenced by the honorable distinction which has been accorded him by the various organizations in which he holds membership, among which may be mentioned the American Veterinary Medical Association, of which he was vice president in 1912 and president in 1913; United States Live Stock Sanitary Association, which elected him vice president in 1910; District of Columbia Board of Veterinary Examiners, of which he was president, 1914-15; International Veterinary Congress; International Congress of Tuberculosis, secretary of section; vice president of the International Veterinary Congress, 1914; International Congress of Hygiene; Society of American Bacteriologists; Veterinary Medical Association of the District of Columbia; American Public Health Association; Society of Experimental Biology and Medicine; honorary member of the Pennsylvania Veterinary Medical Association; member of the International Commission of the American Veterinary Medical Association on the Control of Bovine Tuberculosis, 1910; member of the Cosmos Club; member of the advisory committee of the Hygiene Laboratory of the Public Health Service; and a member of the veterinary advisory committee of the Surgeon General's Department.

In the world there are many men talented for scientific research; there are many who know how to apply technical knowledge for practical good; there are many who have the gift of organization, direction, and administration; but seldom do we find a man so well endowed with a combination of all these qualities as the one whom we honor today in the presentation of this portrait, John R. Mohler.

It is with considerable pride to the committee that circumstances have made possible the presentation of Dr. Mohler's portrait in his native city and under the shadow of the great university in which he acquired his veterinary education.

Messrs. Leonard and Ogilvie have advised me by a letter that in order to give all due significance to the acceptance of the portraits by the Saddle and Sirloin Club they should come from the American Veterinary Medical Association, of which Drs. Salmon, Melvin and Mohler were distinguished members. It is hoped that the efforts of Messrs. Leonard and Ogilvie, Dr. Moore and myself, which were realized through the generosity of Mr. Thomas E. Wilson, and the attitude of the Saddle and Sirloin Club will

meet with the hearty approval of this Association. We also hope that our efforts will be greatly enlarged upon and that the veterinary gallery of the Saddle and Sirloin Club will often be used to not only show the honor due but appreciation by our profession for those that are entitled to such recognition.

PORTRAITS OF DISTINGUISHED VETERINARIANS PRESENTED TO SADDLE AND SIRLOIN CLUB.

Address by VERANUS A. MOORE, Ithaca, N. Y.

Members of the Saddle and Sirloin Club and Gentlemen:

There are two pleasant duties that I am very glad to perform. The first is to express the appreciation and thanks of veterinarians generally, and of the members of the American Veterinary Medical Association in particular, to the Saddle and Sirloin Club for opening "a gallery for the portraits of distinguished veterinarians." Already in this world-famous collection you have paid a high tribute to men who have built up in America a live stock husbandry and industry unequalled elsewhere in the world. Through the medium of the artist you have expressed a genuine and lasting appreciation of the great leaders in the development of strains of domesticated animals and in the organization of a vast business in animals and their products.

It has been said that great leaders may be regarded as possessing a two-fold ancestry, physical and spiritual. They owe much in one way to their parents, their grandparents and remoter progenitors, from some or all of whom they derive in varying degrees and combinations the personal qualities whose special interaction constitutes their greatness. They owe much in another way to their intellectual and moral ancestors, the thinkers and workers who have preceded them in their own and allied fields of thought and action and who have made possible in the course of time the achievements of the hour.

[Editor's Note.—At the meeting of the American Veterinary Medical Association in Philadelphia in August, 1918, the portraits of Drs. D. E. Salmon, A. D. Melvin and J. R. Mohler were presented to the Association by Dr. R. F. Eagle on behalf of the Art Committee of the Saddle and Sirloin Club, with the understanding that the Association should return the portraits to the club for the gallery it had opened for distinguished veterinarians. In addition to these, the portraits of Dr. James Law, contributed by the alumni of the New York State Veterinary College at Cornell University, and of Dr. Leonard Pearson, contributed by the alumni of the School of Veterinary Medicine of the University of Pennsylvania, were presented to the club and received by its President, Mr. A. H. Sanders.

Likewise, it may be said that every great enterprise, whether religious, educational or industrial in character, is dependent on two factors or groups of factors. The first is found in the initiative, foresight and genius of its founder; the other is the agent or agencies that comes to its relief when the movement has advanced as far as it is possible for it to go by itself. Progress is made by the successive and successful application of new truths. Our marvelous animal husbandry and industry were made possible because certain wise men penetrated the mystery of the laws governing the evolution of strains of animal life and others elucidated the forces that tend to destroy it. The time came, in the development of our animal industry, when live stock owners and dealers welcomed the assistance of the men who had sought out methods to protect dumb creation from the ravages of disease—the pestilence that walketh by night—and together the breeders and veterinarians have advanced the industry to a degree of success far beyond that obtainable by either alone.

In the gallery you are dedicating tonight you are giving expression to an appreciation of the services of those who have safeguarded and protected—sometimes against your will—the animal industry of the nation. To emphasize this point it is not necessary to do more than recall the struggle and victory against contagious pleuro-pneumonia in the eighties; the development of the federal meat inspection, authorized in the nineties; and the eradication of foot-and-mouth disease in the last decade. Associated with these triumphs in control are the invaluable benefits derived from the researches in animal diseases which have made possible the formulation of methods for their prevention.

My second task is to present to the Saddle and Sirloin Club, to adorn the walls of this new gallery, the portraits of five veterinarians, individually distinguished for public service and professionally of lineal descent. These men represent the generations from the beginning of the study of animal plagues in America to the present improved veterinary protection of food-producing animals. They established in the United States a permanent system of veterinary education and crystallized, as it were, efficient methods for state and federal control of animal diseases. It has been my good fortune to have known each of these men; to have worked with each; to have known of their ambitions to protect and serve the live stock interests of our country; and to have been thrilled by the kindling inspiration

of their eventful lives. It is most fitting that their portraits should be the first to be unveiled in this new gallery. Around them, we hope there may be assembled the likenesses of the prominent veterinarians of earlier years who served to the limit of existing knowledge the people of their days; and in the future those who may carry the projects already initiated and to be introduced hereafter to a goal of greater perfection.

The first portrait that I have the honor to present is that of Dr. James Law. He may not be known as widely in this circle as the others, but his portrait is unveiled first becasue he was the professional teacher of Dr. Salmon, who, because of his official position, was first selected for this honor.

Dr. Law was born in Scotland, February 13, 1838. He was educated in the schools of Edinburgh, Alfort and Lyons and graduated from the Royal College of Veterinary Surgeons. In 1868, he came to America at the solicitation of the late Hon. Andrew D. White to become professor of veterinary medicine in Cornell University. He came from a country where a large human population had made animal husbandry more difficult than here, but he recognized that the experience of the old world would all too soon be ours. Guided by a prophetic vision of that which was sure to come, he undertook immediately to develop the veterinary profession in this country along the lines indicated by scientific discoveries. He was anxious to prepare men to safeguard adequately our animal population. Later, he brought about the establishment of the first state-supported veterinary college in America, over which he presided for twelve years.

In addition to his great work for veterinary education and his valuable scientific contributions, Dr. Law was America's foremost veterinarian to organize sanitary measures to eradicate infectious diseases.

Among his first pupils was Daniel Elmer Salmon, whom he influenced to go to Alfort for further study. It was also under his tutelage that Dr. Leonard Pearson received his early training in live stock sanitation. Dr. Law was an inspiring teacher. He has been a helpful writer and the author of the most comprehensive work on veterinary medicine in America. He is a man of high ideals and a thorough scholar. He is now living on the campus of Cornell University in his eighty-first year, hale and hearty for one of his age. He still retains a deep interest in all veterinary subjects. He is the "grand old man" of the veterinary profession in America and beloved by all who know him.

His portrait will serve both as an inspiration and a benediction to all the generations of veterinarians that are to come and to go.

Dr. Daniel Elmer Salmon was born at Mt. Olive, N. J., July 23, 1850. He graduated with the degree of Bachelor of Science from Cornell University in 1872 and with the degree of Doctor of Veterinary Medicine in 1876. He studied, at Dr. Law's suggestion, a part of the time between '72 and '76 at Alfort, France. While there he came under the influence and teaching of the great Pasteur. He was among the first in America to report the findings of bacteriological studies of animal diseases. In 1879, he was appointed inspector of the state of New York to serve on the staff of Dr. Law in an effort to stamp out contagious pleuropneumonia of cattle. Later he accepted a position under Commissioner LeDuc, of the United States Department of Agriculture, to investigate animal diseases in the Southern States. In 1883, he was recalled to Washington to establish a veterinary division in the Department. About that time, contagious pleuropneumonia became a serious menace, and he recognized the necessity of a central authority and organization to protect our cattle. He conceived the plan of a Federal Bureau of Animal Industry and through his efforts it was established in 1884. As Chief of that Bureau his work was two-fold: research and the enforcement of regulatory laws. It was with feelings of deep regret that he was gradually forced from researches on animal diseases into the turmoils of administrative life. However, it was for him to recognize the greater problems in the sanitary control of food-producing animals and to initiate the means for their solution.

Among the benefits to the live stock interests which the Bureau of Animal Industry gave to our people during his administration should be mentioned the eradication from America of contagious pleuro-pneumonia in cattle; the federal inspection of exported animals and the ships to carry them; improvement in the quarantine regulations against imported animals; the discovery of the cause of Texas fever and methods for the control of that disease; the establishment of the federal meat inspection service; and many important investigations into the nature of several serious infectious maladies of animals.

As Chief of the Bureau, Dr. Salmon stood firm against political interference with research and other scientific work. He was equally careful to protect the breeders and those engaged in animal traffic. To him, more than to any other, we are in-

debted for an efficient organization to combat animal plagues and a meat inspection service which has protected our commerce in animal products and safeguarded the people against the diseases communicable to them through dumb creation. In these protections our country is not excelled.

In 1906 Dr. Salmon accepted the directorship of the veterinary department of the University of Montevideo for the government of Uruguay. He labored there with great diligence and success for five years, when he returned to this country.

Dr. Salmon was a prominent writer on veterinary subjects, especially those pertaining to the infectious diseases. Many of his publications have appeared in other languages. He was a clear and convincing speaker. He was a member of many scientific societies. With all his greatness he was a modest and kindly man, retiring in nature, of studious habits, just in his deliberations but firm when his decision was reached. A successful pioneer in official live stock sanitation. He died at Butte, Montana, August 30, 1914.

Dr. Alonzo Dorus Melvin, a native of Illinois, was born in Sterling, October 28, 1862. He graduated from the Chicago Veterinary College in 1886 and the same year he entered the service of the Bureau of Animal Industry. He was sent to Liverpool, England, in 1890 to inspect animals and vessels for the United States government. Two years later he was made Chief of the inspection division at Chicago. In 1899 he was appointed assistant chief of the Bureau, which position he held until 1905, when he became its head. To him fell the laborious task and the responsibility of developing the enterprises that had already been initiated. In the twenty-one years during which the Bureau had operated it had undertaken a multiplicity of services for the benefit of the breeders, packers and consumers. To carry such beginnings to a successful conclusion is often more trying than to inaugurate them. With a keen sense of justice and a long-suffering patience, Dr. Melvin advanced the work in hand and met the ever-changing conditions due to new knowledge. Broad and comprehensive as were the purposes of the Bureau, they had to be modified and extended, as well as to be correlated with the work of individual states and institutions. Like his predecessor, Dr. Salmon, he stood firm against the intrusion of political interference with scientific work and bravely met the misguided efforts of live stock owners who from time to time came to believe that science and natural laws could be dis-

regarded in the control of animal plagues. His ability as an administrator, his sterling qualities as a man, his nobility of character, his gentle and sympathetic nature and his loyalty to the purposes of the Bureau endeared him to all. He died suddenly in Washington, D. C., December 7, 1917.

The present Chief of the Bureau of Animal Industry, Dr. John Robbins Mohler, was born in Philadelphia, Pa., May 9, 1875. He graduated from the veterinary department of the University of Pennsylvania in 1896. For a short time he engaged in private practice, but in 1897 he became an inspector in the Bureau of Animal Industry. From 1903 to 1914 he was Chief of the Division of Animal Pathology. From 1914 to 1917 he was assistant chief of the Bureau. Because of the ill health of Dr. Melvin, Dr. Mohler was often called upon to act as the executive. As pathologist, his work is well known to all those interested in animal diseases. He is an honored member of many technical and scientific societies and associations.

The much that could be said of him is epitomized in the fact that his portrait hangs in the gallery of distinguished veterinarians while he himself has not reached the meridian of life or the zenith of his accomplishments for the sciences and industries here represented. Extensive and beneficial as the work of the Bureau has been, I am not reaching beyond the expectations of all who know the present Chief when I predict for it still greater achievements in the future. We all know Dr. Mohler and from our very hearts we wish him success of the highest quality in guiding the destinies of the Bureau. Like his predecessors, he is spending his life in rendering the best possible service in the promotion and protection of the live stock interests of America.

Dr. Leonard Pearson was born in Evansville, Ind., August 17, 1868. He graduated from Cornell University with the degree of Bachelor of Science in 1888 and from the veterinary department of the University of Pennsylvania in 1890. He received the degree of Doctor of Medicine, honorary, from the University of Pennsylvania in 1908.

While at Cornell, Leonard Pearson was a great admirer of his teacher, Dr. Law, who said of him: "He elected veterinary science as his life's work, took and excelled in such work in this line as Cornell then offered and, when he graduated in science in 1888, he joined me in Chicago, seeking a practical acquaintance with the work of the federal government in the extinction

of lung plague in cattle, and he there assisted in a sanitary campaign which for speed and thoroughness has been unparalleled elsewhere."

After graduating from Philadelphia he spent some time in Europe studying veterinary medicine. While in Berlin, he worked in the laboratory of Robert Koch, where he became much interested in tuberculosis. On his return he was made assistant professor of medicine in the veterinary department of the University of Pennsylvania and three years later he was promoted to full professor. In 1897 he was elected Dean of the school.

Dr. Pearson was appointed state veterinarian in 1896 and served continuously in that capacity until his death. It was through his efforts that the Live Stock Sanitary Board of Pennsylvania was organized. He reorganized the veterinary school at the University of Pennsylvania and secured the new buildings and equipment, which are undoubtedly the best in the country. In addition, he procured a farm for experimental work in connection with animal diseases.

Dr. Pearson was a recognized leader in the control of infectious diseases. He was the first in America to use tuberculin for the diagnosis of tuberculosis in cattle. His investigations on bovine tuberculosis were extensive and most valuable. So eminent had he become in state veterinary work that in 1895 Secretary Wilson offered him the position of Chief of the Bureau of Animal Industry. His interest in veterinary education and his loyalty to Pennsylvania led him to decline the offer. He was a prominent writer on veterinary subjects. For years he conducted the veterinary magazine through which he gave to his profession much of the best in the languages of other countries, as well as many valuable contributions of his own.

The reorganization of the veterinary school and the Pennsylvania State Live Stock Sanitary Board are the results of his efforts that stand out in bold relief above much else of great value that he did. While these will be known to the historian, the sterling qualities of the man will abide with those who knew him. He was a manly man with a sweetness of disposition rarely found among men. He may be characterized as a man of kindness, courage and truth. His deep interest in the advancement and betterment of his profession caused him "to burn the candle of life at both ends." As a result, he died a premature death at Spruce Brook, Newfoundland, September 20, 1909.

The portraits of Drs. Law and Pearson are contributed by the alumni of the colleges they presided over; those of the chiefs of the Bureau are presented by the American Veterinary Medical Association. Each of these men has served this Association as its President.

We cannot at this time measure the value to humanity of the work and influence of these truly great and good men. They will stimulate others to greater effort for all time because they possessed the master words of success — character and work. Their labors have extended over a period of fifty years, the most prodigious period of change the world has ever known. We of the veterinary profession are most grateful not alone that these unquestioned leaders have been thus honored but also that the fundamental truths and principles for which they contended in the prevention and control of infectious diseases have been accepted. The general recognition of these unequivocal conditions for success in sanitary work affects beneficially every individual in our land. It is a good omen for the future that the first half-century of live stock sanitation in America has brought such far-reaching and munificent results. The fifty years since this work began are,

"As fifty folios bound and set
By time, the great transcriber on his shelves,"

wherein are written our knowledge of animal diseases, the progress in American veterinary education and the history of our animal industry.

LEGALIZED EXPOSING OF MAN TO TUBERCULOSIS.*

J. F. WINCHESTER, Lawrence, Mass.

Deception is transient, and the day of reckoning is, or soon will be, here for the trafficker in tuberculous animals, and every one that is aware of the presence of tuberculosis among his cattle and swine is deceiving himself when he thinks it is unknown to others.

Tuberculosis in domestic animals prevails over the entire globe, but the centers of this malady are met with in the centers of human population, and in those centers a large percentage of tuberculosis is found in mankind.

*Address before the Essex County Associated Boards of Trade.

There is substantial evidence to indicate that the percentage of tuberculous cattle and swine in some states is very large. Federal inspection for the year ending June 30, 1917, records that 40,000,000 swine were slaughtered, and of that number 3,974,000 were found to be affected with tuberculosis. During the year 1917, 203,193 cattle were found, on postmortem examination, to be affected with tuberculosis.

Since man derives a great deal, and in some instances, his entire sustenance from the flesh and milk from tuberculous animals, we cannot doubt the identity between him and them of the disease.

It has been demonstrated that the bovine type of Koch's bacillus does appear in the human subject, and I venture the opinion that Koch's bacillus of the bovine type is the principal factor in the primary cause of human tuberculosis. The tubercle germ or Koch's bacillus of the bovine type as found in the lesions of cattle is described "shorter, thicker, fatter and stubbier than the longer, leaner, lanker attenuated germs found in the lesions of hogs and men" known as the human type of Koch's bacillus. That the bovine type of Koch's bacillus does appear in the human subject, causing death and disability, has been demonstrated by various investigators.

It has repeatedly been shown that it is possible to so alter the human type of the tubercle bacillus, by systematic passage through animals, that, with the present means at our disposal, they cannot be distinguished from bacilli of the bovine type.

Tuberculosis is an economic problem affecting not only the live stock owner but the nation and, being preventable, it should be eradicated.

Tuberculosis is tolerated because we are so closely associated with the disease that our familiarity with it breeds for it contempt.

Whenever and wherever an effort has been made to eradicate tuberculosis in cattle, and whenever earnest coöperation has been obtained, success has always followed.

In this state it is lawful to traffic in known tuberculous milch cows, as shown in P. D. No. 98, January, 1918, which records 128 reactors without record of their disposition. Delegates from the Lawrence Anti-Tuberculosis League and the Lawrence Board of Health appeared before the Committee on Agriculture, calling their attention to this fact two consecutive years, 1916 and 1917.

The Legislature of 1918 amended Section 25 of Chapter 90 of the Revised Laws, as amended by Chapter 608 of the Acts of the year 1912, by inserting after the word "disease" in the fifth line thereof, the words "Whenever an animal has been released from quarantine by order of the Commissioner, the same animal shall not be again quarantined or isolated by an inspector of animals during a period of thirty days immediately following said release, except upon order of the Commissioner." Signed by the Governor, March 1, 1918.

Here is the chance to revive the fundamental scientific principle established in 1555, by Vieusens, viz: "Appeal to facts rather than to authority."

In this state the federal government is supreme when dealing with contagious diseases in animals.

The federal government has under way a campaign for eradicating tuberculosis, planned under three separate projects:

1. Eradication from pure bred herds of cattle.
2. Eradication of tuberculosis from swine.
3. Eradication from circumscribed areas.

"Pure bred herds which have been tuberculin tested and found to be free from tuberculosis will be classed as accredited herds; that is, herds which the state or federal authorities may certify as being free from the disease." "The known healthy animal will be in great demand and will have entree into any community." This movement is purely a voluntary one, no law required, and its success will depend upon the judgment and decision of live stock owners. It is a practical proposition, in that it is a plan of fair dealing, but without coöperation little can be accomplished.

Mr. H. R. Smith, live stock commissioner of Chicago, has figured, from the statistics of the U. S. Department of Agriculture, what the losses were from tuberculosis in cattle and hogs for the year 1916 at the seven western markets. It shows that fifty train loads of cattle and hogs of forty cars each were tanked because of tuberculosis.

Tuberculosis of swine exists to an alarming degree, due to the fact that dairy by-products, garbage, and the undigested grain and feces from tuberculous cattle are fed to hogs.

The State Board of Health by its district health officer called the attention of the Board of Health of Lawrence, July 31, 1918, to the fact that uninspected carcasses of neat cattle were served to the inmates of the Essex County Training School.

Section 105, Revised Laws, Chapter 75, as amended by General Statutes, 1916, Chapter 139, says in part: "Who, upon his own premises, and not in a slaughter house, slaughters his own neat cattle, sheep or swine, but the carcass of any such animals, intended for sale, shall be inspected, and, unless condemned, shall be stamped or branded, etc."

Complying with notice from the State Board of Health, Mr. D. J. Murphy, Chairman of the Lawrence Board of Health, accompanied me August 1 to the school. We were informed by the Superintendent that the tuberculin test had been applied to the bovines and some of the cattle were considered to be suspicious of tuberculosis.

We were shown the carcass of a cow (a suspect) that had been slaughtered July 31. Said carcass had a diseased skeletal lymph gland; a liver was shown us, said to have been removed from that animal that was diseased. Said carcass was seized and tanked.

Mr. Herman C. Lythgoe, Director of Food and Drugs for the State Board of Health, was advised of these facts August 13, 1918. Under date of September 10, 1918, Mr. Lythgoe writes "A copy of your letter of August 13, to me, has just been submitted to me by the Commissioner of Health.

"If you propose to carry this matter to the courts I would appreciate an opportunity to obtain the results of the trial."

In view of this opinion addressed to the inspector of slaughtering of Lawrence, the Lawrence Board of Health instructed its clerk to communicate with Dr. Eugene R. Kelley, the Commissioner of Health, for his opinion, which in part is as follows: "The legality of which can only be decided by the Attorney General of the Commonwealth" and is as follows:

Boston, October 17, 1918.

Eugene R. Kelley, M. D.,
Commissioner of Health.

Dear Sir:

I acknowledge receipt of your letter of September 20, 1918, requesting opinion on the following questions:

1. Is it lawful or proper for slaughtering to be done at the county training school without inspection by an inspector?

2. Is it lawful to have the meat of such carcass served to the inmates of said institution?

Assuming, therefore, that the slaughtering of neat cattle, sheep or swine belonging to the county is done by the county training school on the premises of the county training school,

and the meat is not intended for sale, I am of the opinion that your first question is to be answered in the affirmative.

It is manifest that such meat, when served to the inmates of the institution is not, within the meaning of the statute, "being offered for sale," and accordingly your second inquiry is to be answered in the affirmative.

Very truly yours,

HENRY C. ATTWILL,
Attorney General.

With the loss of 101,396 human beings from tuberculosis in the United States in 1916, is it desirable or advisable that the words "intended for sale" which were added to Section 105, Chapter 75, in the year 1916 be allowed to remain?

Public Health Bulletin of the State Department of Health, Vol. 5, No. 6, June 1918, pages 158 to 165, inclusive, give rules and regulations and recommendations pertaining to the business of slaughtering and meat inspection, but I fail to find the words "intended for sale."

The percent of tuberculosis in garbage-fed hogs is recorded as high as 40% when non-sterilized garbage is fed. There is a record of 2,199 hogs slaughtered that had been fed sterilized garbage and not a case of tuberculosis. This commonwealth for the past four years has subsidized the hog industry to such a degree that it has become an admitted monopoly.

This commonwealth has commercialized this monopoly to such an extent that the anti hog cholera serum and virus used was the product of one firm—out of the state—and the agents of the Massachusetts Department of Animal Industry have collected from an owner of hogs treated the price of the anti hog cholera serum and virus used. It is a fact and admitted by the Commissioner that the cause of this disease is carried in garbage. *Should the garbage be sterilized,* the State's monopoly and commercial interests would cease.

The cost to the state for this work does not appear separately in the report of the Commissioner of Animal Industry. The minimum cost to the farmer is about fifty cents per hog, and the records show in four years, 109,281 hogs treated.

Dr. Burton R. Rogers in an address before the National Tuberculosis Association calls attention to the fact that childhood is now almost universally accepted as the age when primary tuberculosis infection occurs; even though symptoms may not

appear or death occur until twenty-five or more years have passed. "The two paramount conditions of childhood are close association with the parent and the milk-drinking period. In spite of the prevailing opinion, final analysis may some day prove milk-borne infection of bovine origin as the principal factor in the primary cause of human tuberculosis."

Is tuberculosis really a city disease? Dr. Rogers has made a study of Crawford County, Indiana. It has 304 square miles, less than 12,000 inhabitants, 1,861 farms in 21 towns and villages. The largest town has less than 1,200 people. In a six-year period 24% of the deaths were due to tuberculosis. The Secretary of the State Board of Health of Indiana wrote Dr. Rogers that in the last ten years 2,000 people in this county of less than 13,000 died of tuberculosis.

"In order to explain this high human mortality, investigation should not be confined to the human living conditions, but the condition of the cows and herds of the county must be positively known; what they will, are and have been doing to the hogs.

"It is recorded that during the last week of March, 1918, at Fort Riley, of the 83 boys rejected for tuberculosis, 42 of them came off sunkist farms of Kansas and Oklahoma."

In complying with the request of your Chairman of the Agricultural Committee, I most respectfully submit the following suggestions:

That the amendment I have referred to be repealed.

That the attention of the Committee on Legislation be called to the law that permits traffic in *known* tubercular milch cows.

That the attention of the Governor and Council be called to this situation, that they may correct the monopoly and the commercializing by the Department of Animal Industry in dealing with a garbage-caused contagious disease.

That Section 105, Revised Laws, Chapter 75, as amended by General Statutes, 1916, Chapter 139, be again amended by striking out the words "intended for sale."

Drs. R. W. McCully and Winters were the veterinarains at the National Horse Show in November at Madison Square Garden.

The S. A. T. Corps at the New York Veterinary College at New York University will be demobilized in December.

CLINICAL AND CASE REPORTS.

PARTURIENT PARESIS (MILK FEVER IN COWS).

DANIEL J. HEALY,
Kentucky Agricultural Experiment Station.

During the present war emergency veterinary surgeons are having great difficulty in obtaining the cylinders of oxygen used in the treatment of parturient paresis. In many localities it is impossible to obtain such cylinders, or have the old cylinders refilled.

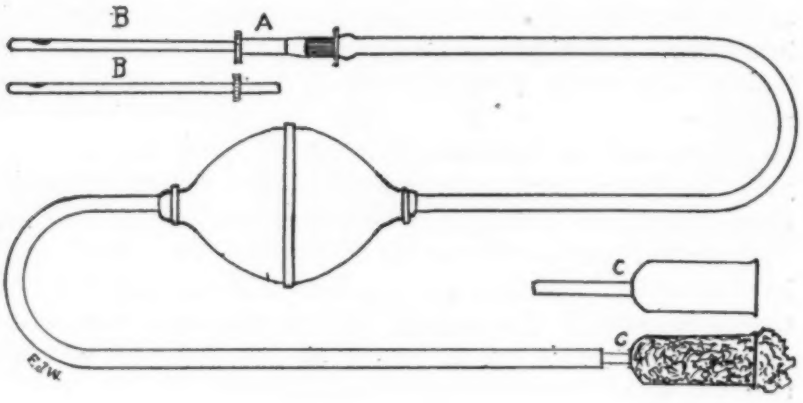
Under these circumstances it is well to recall that fourteen years ago the most popular and successful treatment for parturient paresis was distention of the udder with plain filtered air. That air was later supplanted by oxygen was due to the diminished danger of infection, and the more thorough distention of the udder obtained with oxygen. With proper care, filtered air can be used with as little danger of infection and with as thorough distention of the udder as can oxygen.

The successful treatment of parturient paresis depends upon complete and thorough distention of the udder and not upon the curative value of the substance used to procure such distention. J. Schmidt of Kolding, Denmark, who originated this method of treatment, used a solution of potassium iodid and recognized the value of allowing air to enter the udder with the solution. It was quickly demonstrated by others that carbolic acid solution, creolin solution, lysol solution, sterile salt solution, sterile water, and etherized air could be used successfully.

Andersen of Skanderborg, Denmark, demonstrated that thorough distention of the udder with plain filtered air was sufficient. This method is the most simple, practical and harmless, requiring the simple and inexpensive apparatus illustrated below, or some modification of it.

The cut represents an ordinary bulb syringe of good quality. Inserted into the tubing at "A" is a medium-sized milking tube "B." Inserted into the tubing at "C" is a glass carbon-filter tube "C," diameter at top 20 mm, containing a plug of sterile absorbent cotton through which air entering the syringe must

pass. The milking tube should be sterilized by boiling in water for fifteen minutes and afterward handled in a manner which prevents contamination. The udder and teats of the cow and also the hands of the operator should be cleansed with soap and water, and then carefully disinfected with 5% carbolic acid solution, or some equally good antiseptic. A clean towel should be placed under the udder and teats. The sterile milking tube, previously attached to the syringe, is now inserted into a teat and the quarter thoroughly inflated. Kneading and rubbing the



udder aid thorough inflation. The milking tube is now withdrawn and the teat securely tied with a tape. The remaining quarters are inflated in a similar manner, the milking tube being rinsed in antiseptic solution before introducing into each teat. Should the air be absorbed and no improvement be noted after five hours, the treatment should be repeated, using the same precautions against infection.

The air may be left in the udder for twenty-four hours and then gradually milked out. If the cow is constipated a moderate dose of Epsom salts, one to one and a half pounds, should be given, to which should be added one-half ounce ground ginger and one drachm powdered nux vomica.

For several days an easily digested and laxative diet in restricted quantities should be given, together with a liberal supply of pure water.

Lieutenant John MacTammany, one of New York's city department veterinarians, has returned from France, where he spent more than a year with the A. E. F. at Toul and Verdun.

MONSTROSITIES.

W. J. Crocker,
Laboratories of Veterinary Pathology,
University of Pennsylvania.

CEPHALOTHORACOOMPHALOPAGUS.

(Pig)

This monstrosity, as shown in Figure 1, simulates a dipygus in which the posterior part of the trunk is double, but examination of Figure 2 shows fusion at the head, thorax and umbilicus.

Figure 1.

The head presents but two ears. A common neck contains two separate columns of cervical bones. Fusion of the thoraces occurs at the sternum and is continuous to the navel. There are

Figure 2.

four front legs, four hind legs, two tails and one umbilical cord.

The suffix pagus (G. pagos) means that which has become solid; thus fusion at the head, thorax and umbilicus is expressed by the term cephalothoracoomalopagus.

CONGENITAL INTERNAL HYDROCEPHALUS.

(Calf)

The cranium is greatly enlarged. The brain thin walled and the ventricles distended by watery fluid. It is probably due to

Hydrocephalus.

damming of the cerebrospinal fluid through pressure on the medullary canal in consequence of adhesion of the head fold of the embryo to the amnion.

DIPROSOPUS.

(Calf)

Double monstrosities are derived from a single ovum, as in the case of identical twins, and may vary in degree of completeness of each individual. Diprosopus indicates a double face, in

Diprosopus.

which the cranium is single and the nose and jaw parts double. The remainder of the specimen was that of a single individual. It differs from dicephalus in that the latter presents two separate craniums and often two separate necks.

ABSTRACTS.

CONTAGIOUS ABORTION OF CATTLE.

Circular No. 69, Department of Veterinary Medicine, Kansas Agricultural Experiment Station, discusses contagious abortion of cattle from the standpoint of its nature, cause, symptoms, complications, methods of spread, control and treatment, and, in summary, the authors conclude as follows:

1. Abortion disease is one of the most destructive of all cattle diseases and should receive most careful attention from both beef cattlemen and dairymen.

2. This is a contagious disease; therefore, due to a specific germ rather than accident.

3. It not only causes the death and expulsion of the immature calf, but manifests itself by retained afterbirth and sterility as well.

4. It is spread throughout the herd by the bull and by contamination of feed, and from herd to herd by the purchase of diseased cattle.

5. There is no cure for the disease. Drugs, such as carbolic acid and methylene blue, have proved valueless, while vaccines are still in the experimental stage.

6. Abortion disease can be controlled by proper methods of herd management, being dependent upon three fundamental principles, viz: (1) preventing the spread of infection; (2) developing herd immunity; and (3) treating affected animals to promote recovery and preserve the reproductive functions.

7. Treatment of aborted cows and of retained afterbirth and sterility requires special knowledge and skill; therefore, a graduate veterinarian should be employed if possible.

8. Abortion disease is self-limiting, and will die down of itself if the breeding herd is kept intact.

9. Never sacrifice valuable breeding animals because of this disease; retain and treat the aborters, and raise the normal calves to replenish the herd.

10. Results in combating abortion disease depend upon the establishment of definite plans of herd improvement, and careful attention to the details of sanitation and preventive medicine.

In a concluding statement, the authors remark that, while much remains to be discovered concerning abortion disease, and many points are still in controversy, *enough is known to make its control possible.* (The italics are the editor's.)

TUBERCULOSIS IN THE CAMEL.

The author places on record what is believed to be the first authentic case of congenital tuberculosis in the camel. The lesions were found in the liver of an aborted fœtus, which contained numerous nodules from the size of a pea to a haricot bean, and its lymph glands were enlarged to the size of a walnut, and caseous. Scrapings from the liver nodules and the hepatic lymph glands revealed acid-fast bacilli with all of the characters of typical tubercle bacilli.

The mother of the fœtus was tested with ordinary tuberculin (4 cc subcutaneously) and a distinct temperature reaction was obtained. The animal was then slaughtered and advanced lesions of tuberculosis were found in the visceral organs.

In former articles the author has drawn attention to the small number of cases of tuberculosis recorded in camels outside of Egypt. So far as ascertainable, these do not appear to exceed four in number. The author now places on record an old-standing case of pulmonary tuberculosis in an Algerian camel recently imported into Egypt, and the nature of the lesions indicated that this animal had undoubtedly become infected prior to the date of arrival.—Mason (F. E.), Jl. Comp. Path. & Therap., 1918, June, Vol. 31, No. 2, pp. 100-102.

ANTHRAX DANGERS.

Among the most important recommendations of the Departmental Committee (British) which has been inquiring into precautions for preventing infection from anthrax in the manipulation of wool, goat hair, and camel hair, is the abandonment of the attempt to control anthrax by means of regulation as totally inadequate to cope with the danger. The Committee arrive at the conclusion that the simplest, cheapest, and most effective method of preventing anthrax in the various branches of the wool trade is by disinfection of wool and hair abroad, a course which

possesses the further advantage of destroying anthrax spores at the earliest stage possible. It is recommended that the British government should establish the disinfection authority, and should then take steps to obtain the coöperation of the governments of all organized countries (1) in securing the disinfection of wool and hair and (2) in such other measures as the disinfection authority may advise for the general prevention of anthrax. Arrangements should be made with the governments of British territory abroad whereby the export of materials decided by the disinfection authority to be dangerous is prohibited, except after disinfection in a controlled disinfecting station and unless accompanied by a disinfection certificate. Where possible similar arrangements should be made with the government of such other countries as may appear desirable.—Glasgow (Scotland) Herald.

[*Note.*—The above seems to verify the editorial statement in the December Journal as to the difficulty in controlling anthrax infection.]

CURIOUS CASE OF CHOKING IN A MULE.

The unusual case recorded began as one of colic. After the animal had been walked about for some minutes a discharge of bubbly, stringy, glairy mucus, mixed with pieces of straw, escaped from the nostril. The discharge persisted until the time of death. Palpation over the pharynx caused a certain amount of pain, but pressure over the larynx induced no cough.

The same symptoms were observed the next morning. Food was chewed with difficulty and then rejected. Salivation was profuse.

Water was returned by the mouth and nose, mixed with pieces of straw and peas in a paste. In the evening respiration was accelerated, the nostrils dilated, and the temperature elevated. The region of the pharynx was very sensitive, the thyroid swollen, and slight pressure over the muscles in the lower part of the neck caused their contraction. And as much of the œsophagus as could be palpated was hard to the touch.

On postmortem examination the mucous-membrane of the larnyx and trachea was congested, purple in the cervical part, and dark green at the entrance to the chest. The mucous-membrane of the pharynx was also congested with some erosions,

and the mucus which covered it contained more blood than that which was present in the trachea.

Some pieces of straw were embedded in the mucous-membrane at the base of the epiglottis. The œsophagus presented the most interesting feature. It was filled with a tight dry mass of food as far as a point some 12 to 15 cm from the diaphragm, where the tube presented a certain degree of contraction. The mucous-membrane was swollen and congested, and of a reddish-brown color.

There was hypostatic congestion of the right lung, and the left lung was the seat of several foci of gangrene, doubtless produced by foreign bodies. The other organs were normal.—H. Lambert, Rec. Med. Vet., Vol. XCIV, No. 12, 30th June, 1918. Bull. Soc. Centr. Med. Vet., 20th June, 1918, pp. 287-289. Bull. Soc. Med. Vet. Pratique, Vol. 11, No. 7, July, 1918, pp. 197-199.

STRANGLES: INTRAPALPEBRAL REACTION.

The author seems to have reasons for thinking that a test for strangles (colt distemper), similar to those for tuberculosis and glanders, would serve a useful purpose, and gives a description of such a test with a reagent which he terms *streptococcin*.

The preparation of the reagent is comparatively simple, but it is necessary to first obtain a *Streptococcus equi* of standard virulence. A flask containing about 1 litre of bouillon is inoculated with *Streptococcus equi* of which the vriulence is known. After six to seven days' incubation the culture is subjected to a temperature of 100°C. for a quarter of an hour. Next day it is filtered and again subjected to the same temperature for the same length of time. It is then placed in small vessels, which are afterward sealed with the flame. If protected from the light, the preparation may be kept for six months. The amount to be injected is 1 cc, and the lower eyelid is preferably chosen.

In a negative reaction, the palpebral swelling and œdema is considerable and transitory, and there is absence of conjunctival and lachrymo-nasal exudation. After a period of twenty-four hours, the œdema has usually disappeared.

With a positive reaction, the local œdema usually occurs early, and with a little experience it is possible, sometimes, to state that the reaction is taking place as early as the third, or even the

second, hour. The swelling increases for 12 to 24 hours, extends slightly into the upper eyelid, and diffuses downward into the masseteric region; it is acutely sensitive, and the lymphatics are engorged and painful. The persistence of the swelling depends upon the individual case, but remains until the seventy-second hour or longer.

In brief, the reaction is similar to that of a typical mallein reaction; but it should be noted that it is accompanied by an abundant discharge, which is at first serous and afterward mucopurulent.

In the case of febrile and sub-febrile subjects, the elevation of temperature is said to be considerable.—Cinotti (F.), *Il Nuovo Ercolani,* Vol. XXIII, No. 12, June 30, 1918, pp. 145-156; figures, 4.

Dr. John F. De Vine of Goshen, N. Y., who enjoys one of the largest cattle practices in the East, addressed the Veterinary Medical Society in New York City in December on "Types of Dairy Breeds of Cattle."

Dr. Robert S. MacKellar, retiring Secretary of the City Veterinary Medical Association, filled this office for eight years and was absent but from two meetings in that period. He declined a reëlection.

Drs. R. H. Davis, B. N. Pennell and George W. Heath of Connecticut were visitors to Gotham in November. They all enjoy splendid practices in the "Nutmeg State."

Dr. L. N. Jargo, supervising inspector of the Baton Rouge, La., tick eradication force, has been transferred to stock yards work in Chicago, Ill.

New York City has at least five different humane organizations looking after the welfare of animals in the big city. The American Humane Society, the original Bergh, the Horse Aid Society given to education and coöperative helpfulness. The Woman's Animal Relief with their spacious hospital. A third society that prosecutes very vigorously all those who offend in any way. "The Bide a Wee Home" that rescues the smaller animals and sends many to a country branch home.

Dr. H. N. Guilfoyle, who has been on military leave, reported for duty at Baton Rouge, La., on the 10th instant, being assigned to his former tick eradication duties.

Dr. Sigurd Olson has been transferred from tick eradication work in Louisiana to the force of Dr. R. W. Tuck, New Orleans, Louisiana.

ARMY VETERINARY SERVICE.

The Journal has been requested to announce that army veterinary officers who have contributions which they desire to have published in the Journal should first submit them to the office of the Surgeon-General. This is merely to prevent the possibility of our friends in the Veterinary Corps getting into trouble with the military authorities.

Members of the Association will recall that 1,017 new members were elected at the Philadelphia meeting last summer. Quite a large number of these came from Camp Greenleaf, and it is but just that those who were instrumental in getting this large number should receive the proper credit for it. Captain Otis A. Longley is one of the moving spirits in this work. He was assisted by Major Stokes, Senior Instructor at Camp Greenleaf. They were also assisted by Dr. Ranck, of Mississippi, who stopped at Camp Greenleaf on his way to Philadelphia. Others who helped in the good work are Captain Thomas Hickman, formerly of Kansas City, and Lieutenant George Donnelly of California. Lieutenant M. C. Hall was also a good worker. This active bunch of boosters for the A. V. M. A. are still hitting the trail and the secretary recently received a telegraphic request for 500 application blanks to be sent to Captain Longley, and we rather think that most of them will be used. So far as the A. V. M. A. army work is concerned, we are going to award the "distinguished service medal" to this bunch, headed by Captain Longley, unless someone else can beat them. N. S. M.

THE VETERINARY SERVICE, AMERICAN EXPEDITIONARY FORCES, FROM APRIL 7, 1917, TO SEPTEMBER, 1918.

The Veterinary Service of the American Expeditionary Forces from April 7, 1917, the date we declared war, up to November, 1917, was practically non-existent. We had few animals in the early part, as we were buying them from the French; our tonnage was being used for troops and supplies; divisions as they

arrived were sent to the training areas, they not requiring animals immediately. Twenty-four veterinarians of the first contingent were sent to French veterinary hospitals for instruction.

In November, 1917, the Veterinary Service was transferred by General Order No. 39, American Expeditionary Force, to the Remount Service and placed under the Chief of that service for administration. Major William P. Hill, who had been in France as a military observer with both the French and British veterinary services since January 29, 1916, was appointed Veterinary Advisor to the Chief of the Remount Service. Up to this time there had been no Veterinary Service mentioned in General Orders. March 24, 1918, Major Hill was appointed Chief Veterinarian, American Expeditionary Forces, but the Veterinary Service was still left in the Remount Service.

Majors Klein and Mason had been sent over by the Surgeon General in November to present Special Regulations No. 70 (which are the regulations now in force) in order that they might hitch up with the system in the United States. These were considered unworkable and temporarily disapproved. Majors Klein and Mason some three months later left for Washington with matters standing the same as when they came.

In August, Colonel J. Aitken of the British Veterinary Service, who had been of great service to us in Washington, arrived at Tours, the Headquarters of the Service of Supplies. He had been requested by the Commander-in-Chief to come to Tours and give his advice and help to the Veterinary Service, American Expeditionary Forces.

In September the Veterinary Service was taken out of the Remount Service and reinstated in the Medical Department under the Chief Surgeon, and Special Regulations No. 70 went into effect for the American Expeditionary Forces.

This step immediately gave the Veterinary Service administration in the combat divisions and zone of advance on all technical matters and thereby threw the responsibility of the proper administration on the Chief Veterinarian, which was the thing we had been struggling to obtain.

Colonel D. S. White was ordered from Washington and was appointed Chief Veterinarian, American Expeditionary Forces, and Major Hill, then present Chief, was ordered to Washington as an instructor; his vast experience with the two large armies in the field from January, 1916, to 1918 being considered to be of

great value to the many schools training men for service overseas in the Veterinary Service. The signing of the armistice has thrown his usefulness over here, temporarily, on the side.

Major Hill is now Camp Veterinarian, Camp Zachary Taylor, Kentucky.

There's a Major in the Army that's a Vet. as well as poet
And when it comes to horses he's an artist, and all know it.
With his campaign hat a-tilted and a twinkle in his eye
You'd know he came from Ireland 'ere the brogue began to fly.
Now, the Major is an artist in several different trades
And at slinging of the language he can give them cards and spades.
When it comes to fancy cussing, let me tell you, oh! my son,
If they put it o'er the Major they are surely going some.
One sunny day in autumn while the Major rode along
A rookie at attention was humming of a song.
The Major stopped, one look he gave, but not a second shy,
He turned the torrents of his wrath upon that one poor guy.
For thirteen minutes by the watch the English language flew—
Dark sulphur fumes were eddying, the air was thick and blue.
The Major stopped an instant, for breath he was at loss,
The rookie blandly smiled and said, "Me no spik Englis, Boss."

* * * * * * * * * *

The Major smiled a sickly grin and quickly rode away.
His horse still snorts so often he can scarcely eat his hay.
Now when the poor Lieutenants see the Major's wrath astir
They snappily salute and say, "I no spik English, Sir."

N. S. M.

It is rumored that the veterinary dentists of the Empire State will seek helpful legislation at Albany. The Knight bill has placed all veterinary dentists under the ban as violators of the veterinary practice law.

The election of officers at the County Veterinary Medical Society in December resulted in the election of Dr. David W. Cochran as President and Dr. J. E. Crawford of Far Rockaway as Secretary-Treasurer.

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

SECRETARY'S OFFICE.

The committee appointed by President Moore, composed of Drs. L. E. Day, Geo. Frost, H. R. Ryder, A. C. Worms and D. Joffrey, to canvass the vote for members of the Executive Board of the A. V. M. A. for Districts No. 2 and No. 3, met on November 20 at the Secretary's office. Those present were Drs. Day, Ryder and Frost, The committee organized by electing Dr. L. E. Day as chairman, N. S. Mayo acting as secretary.

Before counting the votes the following action was taken, moved and carried that unsigned ballots and those signed by typewriter or stencil be not counted.

The following is the result of the ballot:

District No. 2—Total number of votes cast, 384; T. E. Munce 190, W. Horace Hoskins 127, L. H. Howard 32, Lieutenant Colonel C. J. Marshall 22, Cassius Way 13.

District No. 3—Total number of votes cast, 316; S. H. Bennett 101, A. H. Baker 93, D. M. Campbell 56, S. Brenton 51, A. McKercher 15.

Secretary Mayo reported that he had received requests from members for a number of nominating votes to be sent to a single member. This was refused and only one nominating vote was sent to each member. It was moved and carried that the action of the Secretary in sending only one nominating ballot to each member in their respective districts be approved.

Secretary Mayo also reported that a request for the announcement of the number of nominating votes received by each candidate was refused.

It was moved and carried that the Secretary's action be approved.

N. S. MAYO.

The Executive Board has decided in favor of New Orleans, La., for the 1919 annual meeting of the A. V. M. A., during the week beginning October 13.

Dr. George Hilton has been appointed a member of the Sub-Committee on Journal in place of Dr. W. Horace Hoskins.

Dr. Robert Hamilton, 520 Fort Street, Victoria, B. C., has been appointed resident secretary for British Columbia.

Dr. A. W. French, State Veterinarian, Cheyenne, Wyoming, has been appointed resident secretary for that state, to succeed the late Dr. Millard.

OTHER ASSOCIATIONS

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION.

The 1919 convention of the Pennsylvania State Veterinary Medical Association will be held at Harrisburg, Penn., January 22 and 23, with a full and interesting program.

Among those who are to take part may be mentioned the following: Dr. V. A. Moore, President American Veterinary Medical Association; Dr. J. H. McNeil, State Veterinarian of New Jersey; Dr. J. A. Kiernan, Chief of the Tuberculosis Eradication Division, Bureau of Animal Industry; Dr. John Adams, Veterinary School, University of Pennsylvania; Dr. M. Jacob, State Veterinarian of Tennessee and Treasurer of the A. V. M. A.; Dr. Edw. A. Cahill, Indianapolis; Drs. B. F. Senseman, of Philadelphia, and others.

The subjects to be discussed will include the Practitioner in the Control of Infectious Disease; the Live Stock Industry in South America; the Progress of Tuberculosis Eradication; Some Practical Topics Relating to Surgery; there will be a symposium on hog topics; Purpura Hemorrhagica will be discussed; and there will be a discussion on Infectious Abortion and Sterility in Cattle.

A cordial invitation is extended to all veterinarians, including those in adjoining states, to attend this convention.

T. E. MUNCE, Corresponding Secretary.

STATE VETERINARY MEDICAL ASSOCIATION OF OHIO.

The State Veterinary Medical Association of Ohio will hold its thirty-sixth annual convention at the New Southern Hotel, Columbus, January 9 and 10, 1919.

In this epochal atmosphere this meeting, in many respects, will be the most important in the history of the Association. In fact, the future welfare of the profession may be largely influenced by the spirit of coöperation and policies to be developed at the meeting.

The world-wide upheaval has wrought changes with us as with every other line of work concerned with the best interest of our commonwealth, and with the recognition and privileges accorded our profession has assumed a position and an importance equal in every respect to that of our sister profession, "Human Medicine." In accordance with this elevated standard, and in order to retain the confidence and respect of the modern stock-raiser and the public at large, and if we are to meet these increased obligations successfully, it behooves every veterinarian, whether scientist or practitioner, to keep abreast of the developments and discoveries that are new in his profession.

There is only one way to keep in touch with the progressive changes, and that is to mingle with the leaders, the thinkers and the workers that you will meet at a meeting of this kind.

The program will include a number of men who are intimately and actively associated with matters that are of the utmost importance to the veterinary profession. There will also be in attendance representatives from the Veterinary Corps of our Army who will enlighten us on the demands of the profession by war conditions.

For literature and information concerning the Association, address the Secretary, R. I. Bernath, Wauseon, Ohio.

NEW YORK STATE VETERINARY COLLEGE ANNUAL CONFERENCE.

The annual conference for veterinarians at the New York State Veterinary College, Cornell University, Ithaca, N. Y., will be held January 16 and 17. An instructive program will be provided. This conference is for the practitioners of veterinary medicine in New York State, but any veterinarian who desires to attend will be most welcome. The program will be ready early in January. V. A. MOORE, Director.

Dr. Hiram T. Gaetz of Buffalo, N. Y., addressed the Western New York Medical Society in December on some historical points in the history of veterinary medicine in America.

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS.

Our National Executive Committee is making a big drive for 100% membership in this Association by January 1, 1919, and this office is coöperating with the four zone vice presidents in organizing their respective zones. It is very desirable that we have a large mailing list of active members to properly boost our classification bill when it is introduced. It has been suggested that our members would gladly coöperate in this big membership drive by writing personal letters to their friends in unorganized territory if they know where the non-members were located. The following statement of our membership is therefore respectfully submitted:

EASTERN ZONE.

Zone Vice President: Dr. Leland D. Ives, 104 West 42nd St., New York.

METROPOLITAN DIVISION.	Number of Members
Dr. J. A. Eadie, Secretary, 104 W. 42nd St., New York, N. Y. (Units at New York City and Brooklyn, N. Y., Jersey City, Newark and Paterson, N. J.)	67
BUFFALO (N. Y.) DIVISION.	
Dr. E. T. Faulder, Secretary, 69 Monticello Ave., Buffalo, N. Y.	24
PENNSYLVANIA DIVISION.	
Dr. M. J. Maloney, Secretary, 5423 Christian St., Philadelphia.	26
CLEVELAND (OHIO) DIVISION.	
Dr. Roy F. Leslie, Temporary Secretary, 6805 Bridge Ave., Cleveland, Ohio	12
INDIANA DIVISION.	
Dr. W. W. Shartle, Corresponding Secretary, 413 North New Jersey St., Indianapolis, Ind	41
MICHIGAN DIVISION.	
Dr. B. J. Killham, Secretary-Treasurer, Court House, Adrian, Michigan	23
Total membership of subordinate associations	193
Total number members at large	10
Grand total membership of Eastern Zone	203

CENTRAL ZONE.

Zone Vice President: Dr. M. Guillaume, in care of Dr. W. N. Neil, Drovers National Bank Building, 42nd and Halsted Sts., Chicago, Ill.

ILLINOIS DIVISION.	Number of Members
Dr. F. H. Benjamin, Secretary, 6732 Loomis St., Chicago, Ill.	134
MISSISSIPPI VALLEY DIVISION.	
Dr. A. J. Maloney, Secretary, National Stock Yards, Ill. (Units at National Stock Yards, East St. Louis, Mounds	

and Jacksonville, Ill., and St. Louis, Mo., and Union City, Tenn.)	46
MISSOURI DIVISION.	
Dr. Ralph Graham, Secretary, Box 59, Jefferson City, Mo.	38
IOWA DIVISION.	
Dr. F. T. Suit, Secretary-Treasurer, in care of T. M. Sinclair & Co., Waterloo, Iowa (estimated)	43
MINNESOTA DIVISION.	
Dr. M. O. Anderson, Corresponding Secretary, 633-34 Live Stock Exchange Building, South St. Paul, Minn.	31
AUSTIN (MINNESOTA) DIVISION.	
Dr. Ray Hoefling, Secretary, 309 S. Franklin St., Austin, Minn.	5
WISCONSIN DIVISION.	
Dr. S. J. Walkley, Secretary, 185 Northwestern Ave., Milwaukee, Wis.	21
Total membership of subordinate associations	318
Total number members at large	4
Grand total membership of Central Zone	322

SOUTHERN ZONE.

Zone Vice President: Dr. J. S. Grove, 215 Exchange Building, Stock Yards Station, Oklahoma, Oklahoma.

	Number of Members
DISTRICT OF COLUMBIA DIVISION.	
Dr. L. B. Ernest, Secretary, Kensington, Md.	36
VIRGINIA DIVISION.	
Dr. A. H. Denham, Secretary-Treasurer, 418 Lyric Building, Richmond, Va.	13
WEST VIRGINIA DIVISION.	
Dr. C. E. Mootz, Secretary-Treasurer, 300 Federal Building, Wheeling, W. Va.	6
OKLAHOMA DIVISION.	
Dr. Leslie J. Allen, Secretary-Treasurer, 408-409 Patterson Building, Oklahoma, Okla.	34
TEXAS DIVISION.	
Dr. Harry Grafke, Secretary-Treasurer, 606 Flatiron Building, Fort Worth, Texas	48
Total membership of subordinate associations	137
Total number members at large	43
Grand total membership of Southern Zone	180

WESTERN ZONE.

Zone Vice President: Dr. B. W. Murphy, 22 Federal Building, Topeka, Kansas.

	Number of Members
KANSAS DIVISION.	
Dr. B. W. Murphy, Secretary, 22 Federal Bldg., Topeka, Kan.	74
NEBRASKA DIVISION.	
Dr. A. R. Smith, Secretary-Treasurer, 2615 D St., South Side Station, Omaha, Neb.	50

SOUTH DAKOTA DIVISION.	
Dr. C. L. White, Secretary, in care of Jno. Merrill & Co., Sioux Falls, S. D.	10
"MILE HIGH" DIVISION OF COLORADO.	
Dr. C. L. Hall, Secretary, Room 303 Live Stock Exchange Building, Denver, Col.	24
CALIFORNIA DIVISION.	
Dr. G. P. Rebold, Chairman Pro Tem., 836 56th St., Oakland, Cal.	4
Total membership of subordinate associations	162
Total number members at large	35
Grand total membership of Western Zone	197

SUMMARY.

	B. A. I. Veterinarians in Zone.	Members N. A. of B. of A. I. V.	Non-Members
Eastern Zone	339	207	132
Central Zone	435	322	113
Southern Zone	509	180	329
Western Zone	359	197	162
Total	1642	906	736

Rosters of members of all subordinate associations arranged alphabetically will be published in connection with minutes of proceedings of our Philadelphia convention. Secretaries of subordinate associations should advise this office when their members transfer to other subordinate associations, so that the membership rosters in this office may be properly revised. All subordinate associations and members at large are requested to send to this office the names and addresses of all known non-members in their respective states, reporting result of any correspondence they have had with said non-members. Those associations that have adopted a constitution and by-laws are requested to forward copy of same to this office. In organizing new subordinate associations it would be well to have constitutions of same provide for affiliating with the N. A. of B. of A. I. V.

MEMBERS AT LARGE.

The names and addresses of the members at large of our Association are as follows:

EASTERN ZONE.

Zone Vice President: Dr. Leland D. Ives, 104 W. 42nd St., New York.

NEW HAMPSHIRE.

Carnachan, T. W. ..... Keene, N. H.

VERMONT.

Spindler, J. E. ..... Newport, Vt.

MAINE.

Smith, Arthur N.....Portland, Me.
Green, L. K.....Auburn, Me.

MASSACHUSETTS.

Crossman, E. A.....Boston, Mass.
Blake, F. E.....Springfield, Mass.

OHIO.

Staub, A. F.....Dayton, Ohio
Borchers, W. H.....Dayton, Ohio
Hattery, Morton P.....Dayton, Ohio
Homiller, J. P.....Dayton, Ohio

CENTRAL ZONE.

Zone Vice President: Dr. M. Guillaume, in care of Dr. W. N. Neil, Drovers National Bank Building, 42nd and Halsted Sts., Chicago, Ill.

ILLINOIS.

McDonald, James.....Springfield, Ill.
Plew, J. F.....Springfield, Ill.

IOWA.

Franzmann, P. A.....Davenport, Iowa

MINNESOTA.

Elliott, C. L.....Winona, Minn.

SOUTHERN ZONE.

Zone Vice President: Dr. J. S. Grove, 215 Exchange Building, Stock Yards Station, Oklahoma, Okla.

KENTUCKY.

Lawton, R. G.....Lexington, Ky.

NORTH CAROLINA.

Yager, E. P.....Washington, N. C.
Blackman, R. A.....Whiteville, N. C.
Knilans, A. J.....Elizabeth City, N. C.
Keiny, E.....Washington, N. C.
Taylor, H. B.....Newbern, N. C.
Smith, M. G.....Wilmington, N. C.
O'Hare, J. S.....Williamston, N. C.

SOUTH CAROLINA.

Riley, Garrie W.....Orangeburg, S. C.

GEORGIA.

Lovejoy, J. E.....Augusta, Ga.
Lemon, Cecil S.....Augusta, Ga.
Boman, Thomas W.....Augusta, Ga.
Springer, George E.....Augusta, Ga.
Latta, Walter R.....Augusta, Ga.
Cole, Guy T.....Moultrie, Ga.
Bevan, A. L.....Moultrie, Ga.
Hall, G. M.....Moultrie, Ga.
Dinse, A. J.....Moultrie, Ga.

ALABAMA.

Tierney, E. N.....Andalusia, Ala.

ARIZONA.

Gaston, John T.....Bisbee, Ariz.

FLORIDA.

Aufente, John R.....Chipley, Fla.

LOUISIANA.

Tuck, R. W.....New Orleans, La.
Baker, Odie I.....New Orleans, La.
Cook, Stanley C.....New Orleans, La.
Tucker, H. H.....New Orleans, La.
Wishard, Dell E.....New Orleans, La.
Bruns, G. H.....Winnfield, La.

ARKANSAS.

Bux, Joe H.....Little Rock, Ark.
Gregory, M. W.....Little Rock, Ark.
Connor, D. D.....Little Rock, Ark.
Young, Clifford.....Little Rock, Ark.
Swanson, P. O.....Little Rock, Ark.
Brouse, S. C.....Little Rock, Ark.
Marsh, E. T.....Little Rock, Ark.
Kelly, Ray.....Little Rock, Ark.
Jerome, C. A.....Little Rock, Ark.
Mills, J. T.....Little Rock, Ark.
Davis, W. L.....Little Rock, Ark.
Jung, O. E.....Little Rock, Ark.
Welsh, R. M.....Little Rock, Ark.
Christianson, R. B.....Little Rock, Ark.
Johnson, P. A.....Little Rock, Ark.
McDonald, W. A.....Conway, Ark.

WESTERN ZONE.

Zone Vice President, Dr. B. W. Murphy, 22 Federal Bldg., Topeka, Kan.

NORTH DAKOTA.

Cohenour, H. H.....Bismarck, N. D.
Hollenbeck, J. B.....Bismarck, N. D.

NEVADA.

Butterfield, L. C.....Reno, Nev.

MONTANA.

Beaumont, E. V.....Billings, Mont.
Berdan, Augustus.....Great Falls, Mont.
Boyd, B. W.....Miles City, Mont.
Ehlers, G. H.....Scobey, Mont.
Ewers, S. V.....Ft. Keogh, Mont.
Hulbush, Chas. A.....Sweet Grass, Mont.
Snyder, Rudolph.....Helena, Mont.
Walker, C. C.....Helena, Mont.

OREGON.

Blackwell, A. M.....North Portland, Ore.
Foster, Sam B.....Portland, Ore.
Hancock, H. J.....North Portland, Ore.
Joss, E. C.....Portland, Ore.
Lundell, A. R.....North Portland, Ore.

CALIFORNIA.

Collins, D. E.....Arcata, Cal.
Coleman, A. T.....Los Angeles, Cal.
Echols, B. C.....Los Angeles, Cal.
Farley, J. A.....Los Angeles, Cal.
Irons, G. T.....Los Angeles, Cal.
Kampschmidt, F. L.....Los Angeles, Cal.
Kellogg, C. F.....Los Angeles, Cal.
Koen, A. R.....Los Angeles, Cal.
McFarland, R. A.....Los Angeles, Cal.
Fuchs, Geo. A.....Coloma, Cal.
Fields, S. M.....Pomona, Cal.

Payne, A. J. ..... Sacramento, Cal.
Cloud, J. E ..... San Diego, Cal.
Darling, Robert ..... San Diego, Cal.
Hicks, H. H. ..... San Francisco, Cal.
Hurlbut, F. ..... San Francisco, Cal.

WASHINGTON.

Culbert, R. W. ..... Spokane, Wash.
Dye, W. C. ..... Walla Walla, Wash.
Henneberger, W. B. ..... Walla Walla, Wash.

SUMMARY.

Zone	Number Members at Large
Eastern	10
Central	4
Southern	43
Western	35
Total number members at large	92

Extracts from our national constitution as amended and adopted at the Philadelphia convention, August 19-21, 1918:

"Art. 2, Sec. 1. This organization shall consist of state, divisional and district associations and members at large."

"Art. 3, Sec. 1. The membership shall consist of active and honorary members."

"Art. 3, Sec. 2. Any veterinarian in the employ of the Bureau of Animal Industry may become a member of this association."

"Art. 10, Sec. 2. The per capita tax to cover the expenses of this association shall be $3.00 per annum, and shall be collected from all active members by the state, divisional and district associations, and by them remitted to the National Secretary. Members at large shall remit per capita tax direct to the National Secretary. This tax may be paid semi-annually."

All members at large are urged to correspond with B. A. I. veterinarians in their vicinity, urging them to enroll as members of this Association. It would be to the best interests of all concerned to form sub-ordinate associations where conditions are favorable, as we can do some very effective work through such organizations in coöperating with the various live stock sanitary boards and state veterinary medical societies. Where conditions do not favor the formation of subordinate associations, all B. A. I. veterinarians are urged to enroll as members at large.

SPECIMEN CONSTITUTION AND BY-LAWS.

The following constitution and by-laws, adopted by the Wisconsin Division, National Association of Bureau of Animal Industry Veterinarians, is published for the possible assistance it may render other local organizations:

PREAMBLE.

The objects of this division shall be:

1. The advancement of the professional and material interests of the veterinarians of the U. S. Bureau of Animal Industry.

2. To affiliate with the National Association of Bureau of Animal Industry Veterinarians. To coöperate with the American Veterinary Medical Association, the Wisconsin Veterinary Medical Association, United States Live Stock Sanitary Association and the Wisconsin Live Stock Sanitary Board in securing legislation for the mutual advancement of the veterinary profession and promotion of the live stock industry.

3. To coöperate with the officials of the U. S. Department of Agriculture in promoting the efficiency of the Bureau service and to uphold the civil service rules and regulations.

4. To encourage all Bureau veterinarians to become members of the American Veterinary Medical Association.

CONSTITUTION.

ARTICLE I.

Title.

Section 1. This body shall be known as the Wisconsin Division of the National Association of Bureau of Animal Industry Veterinarians.

ARTICLE II.

Membership.

Section 1. The active members shall be the veterinary inspectors of the Bureau of Animal Industry.

Section 2. Honorary members shall be at the discretion of this Division.

ARTICLE III.

Officers, Committees and Elections.

OFFICERS.

Section 1. The elective officers of this Division shall consist of a president, first and second vice presidents, and a secretary-treasurer, all of whom shall be elected by ballot of uniform size and color. A majority of all votes legally cast shall constitute a choice. They shall hold their offices for the term of one (1) year, or until their successors are elected and qualified.

ELECTIONS.

Section 2. All delegates to the national convention shall be nominated three months prior to the meeting of the American Veterinary Medical Association each year.

Section 3. All delegates to the national convention shall be elected two months prior to the meeting of the American Veterinary Medical Association each year.

Section 4. All active members of this Division in good standing and assigned to stations other than Milwaukee and Cudahy, Wisconsin, shall be duly notified by the secretary-treasurer of all nominations, said notice to be accompanied with sufficient blank ballots of uniform size and color for a first and second choice vote. The secretary-treasurer shall request said members to return all ballots in sealed envelopes and said envelopes shall be delivered to the tellers at time of election.

COMMITTEES.

Section 5. The regular committees of this Division to be appointed by the president shall be: an auditing committee consisting of three (3) members and a committee on legislation, consisting of three (3) members.

ARTICLE IV.

Duties of Officers.

THE PRESIDENT.

Section 1. The president shall preside at all meetings of this Division, and be a member of all committees. He shall appoint all committees not herein provided for. He shall sign all warrants drawn on the treasurer, and perform such other duties as the rules and usages of this Division may require of him. He shall have no vote except on questions where the votes are equally divided and in the election of officers.

FIRST VICE PRESIDENT.

Section 2. The first vice president shall perform the duties of the president in his absence, or in the event of his refusal or neglect to perform the duties of his office.

SECOND VICE PRESIDENT.

Section 3. The second vice president shall perform the duties of the president when for any reason those duties are not performed by the president or first vice president.

SECRETARY-TREASURER.

Section 4. The secretary-treasurer shall conduct all correspondence of this Division and keep a correct record of the minutes of the proceedings of this Division. On or about March 1 and September 1 of each year he shall furnish to the National Secretary a report showing the names and addresses of all

B. A. I. veterinarians in the State of Wisconsin, and the names and addresses of all members of this Division, said report to be arranged in alphabetical order by names and stations. On or about March 1 and September 1 of each year he shall remit per capita tax to the National Secretary at the rate of three dollars ($3.00) per annum, or one dollar and fifty cents ($1.50) per term of six (6) months, for each active member on the roster of this Division. He shall receive all dues and obligations and issue receipts therefor and report the financial condition of the Division and the names of all members in arrears for dues or other indebtedness to this Division at each meeting. He shall submit at each meeting an itemized statement of all moneys received and disbursed.

ARTICLE V.

Fiscal Year.

Section 1. The fiscal year of this Division shall begin September 1 and end August 31.

Revenues.

Section 2. The annual dues of each active member of this Division shall be four dollars ($4.00), payable semi-annually on September 1 and March 1.

ARTICLE VI.

Amendments.

Section 1. Any resolution for amending of any article of this constitution shall be offered in writing, duly signed by an active member of this Division in good standing. Such resolution must be adopted by a majority of all votes legally cast.

BY-LAWS.

ARTICLE I.

Meetings.

Section 1. All meetings of this Division not herein provided for shall be called by the president upon request of four active members of this Division in good standing, and three (3) days' notice of all meetings shall be given.

ARTICLE II.

Quorum.

Section 1. Seven (7) members shall constitute a quorum at all meetings of this Division.

ARTICLE III.

Rules of Order.

Section 1. In the deliberations of this body "Robert's Rules of Order" shall be the parliamentary standard and guide in determining questions of order when they are not in conflict with these by-laws.

ARTICLE IV.

Order of Business.

Section 1.

1. Roll call of officers.
2. Reading of minutes of previous meeting.
3. Reading of bills.
4. Report of secretary.
5. Report of treasurer.
6. Report of standing and special committees.
7. Application for membership and election of new members.
8. Reading of correspondence.
9. Unfinished business.
10. New business.
11. Nomination of officers and delegates.
12. Election of officers and delegates.
13. Good and welfare of the Division.
14. Adjournment.

ARTICLE V.

Amendments.

Section 1. These by-laws may be amended in the same manner as provided for amending the constitution.

S. J. WALKLEY, Secretary,
N. A. of B. of A. I. V.

U. S. LIVE STOCK SANITARY ASSOCIATION.

The twenty-second annual meeting of the United States Live Stock Sanitary Association was held in Chicago December 2, 3 and 4 at the Hotel La Salle. The attendance was unusually large this year, not only of members but also of visitors. Every one seemed to enjoy the program and to take an active part in the discussions of the several topics, which included Tuberculosis, Influenza, Blackleg, Hemorrhagic Septicemia, Parasitic Diseases, Necrobacillosis, Hog Cholera, and Contagious Abortion.

The following officers were elected for the ensuing year:

President—G. W. Dunphy, State Veterinarian, Lansing, Michigan.

Vice Presidents—J. H. McNeil, Trenton, N. J.; C. P. Fitch, St. Paul, Minn.; O. H. Eliason, Madison, Wis.; J. S. Anderson, Lincoln, Neb.

Secretary-Treasurer—S. H. Ward, St. Paul, Minn.

MRS. J. A. FLAWS, Clerical Secretary.

NECROLOGICAL.

DR. ROY A. LUZADER.

Dr. Roy A. Luzader, of Morrisonville, Ill., died on October 31 at Bridgeport, Conn., from pneumonia while on an automobile trip. Dr. Luzader was a graduate of the Chicago Veterinary College in 1910, and joined the A. V. M. A. in 1911. He took an active part in Association affairs, and was prominent among the younger practitioners in Illinois.

DR. HUGH R. MILLARD.

Dr. Hugh R. Millard, Cheyenne, Wyo., passed away recently. Dr. Millard had just been appointed resident secretary for that state. He was secretary of the State Board of Seed Commissioners and Deputy State Veterinarian of Wyoming. He died November 25 of pneumonia, and a child of his died a few days later from the same disease.

Dr. Millard was a graduate of the New York State Veterinary College, Ithaca, N. Y., 1911, and joined the A. V. M. A. in 1912.

DR. F. H. ANDERSON.

Dr. F. H. Anderson, a prominent practitioner of Evanston, Ill., died at his old home in Forest, Canada, on December 7, 1918, heart trouble being the cause of death.

Dr. Anderson had retired from practice several years ago. He was not only a very able veterinarian, but took an active part in local and state affairs.

DR. OSCAR J. JOHNSON.

Dr. Oscar J. Johnson, Miles City, Mont., died recently as the result of influenza. He was a graduate of the Ohio State University in 1911, and joined the A. V. M. A. in 1913.

DR. D. R. BENJAMIN.

Dr. D. R. Benjamin, Le Roy, Ill., succumbed to influenza on November 8, and his wife died two days later from the same infection. Dr. Benjamin was a member of the Illinois Veterinary Association, but had not become affiliated with the A. V. M. A.

DR. C. E. BLAKELY.

Dr. C E. Blakely, Corydon, Iowa, died November 13 as the result of influenza. Dr. Blakely was not, however, a member of the A. V. M. A.

DR. A. L. SEDERHOLM.

Dr. A. L. Sederholm, 1129 5th Avenue, Moline, Ill., died the early part of December. He was born in 1885, and graduated from the Chicago Veterinary College in 1906. The Doctor is survived by his parents and one brother. Burial took place in Riverside.

DR. T. W. TAYLOR.

Dr. T. W. Taylor, Macomb, Ill., died on October 30, after a short illness, from pneumonia.

Dr. Taylor was a graduate of the McKillip Veterinary College in 1917, and joined the American Veterinary Medical Association the same year.

DR. S. P. KENDALL.

Dr. S. P. Kendall, Wood River, Ill., died on October 3. He was a graduate of the McKillip Veterinary College and 1917, and became a member of the A. V. M. A. in 1917.

DR. S. H. WARD.

Dr. S. H. Ward, State Veterinarian of Minnesota, died at his home in St. Paul, December 13, of influenza complications.

Dr. Ward was attacked with influenza while attending the U. S. Live Stock Sanitary Association meeting in Chicago, and was confined to his room for several days, but appeared to have recovered, and returned home on December 6.

Dr. Ward was a graduate of the Ontario Veterinary College in 1894, and joined the A. V. M. A. in 1898, and has taken an active part in the work of the Association ever since. He was Chairman of the Committee on Intelligence and Education in 1916-1917, and had served on other important committees. He had been President of the United States Live Stock Sanitary Association, and was Secretary-Treasurer at the time of his death.

I have known Dr. Ward for many years and was closely associated with him for two years on the Committee on Intelligence and Education.

He was a modest man of sterling character and of rare good judgment and constructive ability. The better one knew him, the more his real worth was manifest. A genial companion, a true gentleman, and a loyal, unselfish friend. S. H. Ward, I salute you! *Vale!* N. S. M.

WILLIAM DEMPSTER HOARD.

In the ripeness of 82 years—most of them spent in elevating farm dairying from drudgery to a plane of dignity—William Dempster Hoard died November 22 at his home in Fort Atkinson, Wisconsin. With meager opportunities and facing discouragement almost crushing at times, Governor Hoard carved for himself a career of service to his own and future generations.

Outstanding events of his life show how an early interest in dairying bore results which he lived to enjoy but which were so numerous that multitudes shared in the benefits. Born October 10, 1836, at Stockbridge, N. Y., Governor Hoard received a country district school education and at the age of 16 went to work as a hired man on a large dairy farm nearby, where he learned butter and cheese making.

In 1857 he moved to Wisconsin and supported himself by teaching school and cutting wood for 25 cents a cord. He married

in 1860 and enlisted in the Army the following year. After the Civil War, he engaged in the nursery business at Columbus, Wis., because, as Governor Hoard said, "there was no work for me to do in Wisconsin as a butter or cheese maker." During the 70's and 80's he urged Wisconsin farmers to engage in dairying and was among the pioneers to organize the Wisconsin State Dairyman's Association, the first of its kind in America. In 1885 he started Hoard's Dairyman as a four-page sheet. In 1888 he was elected Governor of Wisconsin and his administration was marked by much constructive legislation, including the creation of the dairy and food commission and similar measures for the advancement of the dairy industry.

Big-hearted and kind himself, he saw clearly the need for dairy laws and rigid inspection to protect the future industry against practices that would rob it of dignity and interfere with its best development. Time has indorsed his early judgment in these and countless other matters. With the passing of Governor Hoard—the dean of dairying in America—a beloved leader disappears from among us, while another name is inscribed on the scroll of national honor.

If all of the people in Fort Atkinson, Wis., had belonged to one great family, and the late Governor had been the head of that family, no more reverence, respect, and devotion could have been shown to his memory than was indicated on the day of the burial. The entire business of the city was suspended for the day and the people all took part in the funeral ceremonies. One of the most impressive parts of the services was a double procession of school children several blocks long through which the funeral procession passed. Governor Hoard was a great favorite of the children and this manner of showing their feeling for his memory was most impressive.

Both the Bureau of Animal Industry and the veterinary profession were represented at the funeral in the persons of Assistant Chief Rawl and Dr. A. E. Behnke of Milwaukee, who acted as honorary pallbearers. All members who attended the Chicago convention of our Association in 1909 recall with pleasure the able address of Governor Hoard on the dairy industry, after which the Governor was unanimously elected to honorary membership in the American Veterinary Medical Association.

J. R. M.

MISCELLANEOUS.

DR. J. G. RUTHERFORD CHOSEN MEMBER OF CANADIAN RAILROAD BOARD.

Intense interest is manifested in Western Canada over the appointment of Dr. J. G. Rutherford of Calgary to be member of the Dominion Railway Commission in place of D'Arcy Scott, whose ten-year term has expired. Dr. Rutherford is the first western man to win a position on the board, and the fact that he has been very closely identified with the agricultural interests of the western prairies, first as Dominion Live Stock Commissioner and later as head of the irrigation work and the live stock branch of the Canadian Pacific Railway, is pointed to as significant of the growing importance of the live stock industry and the new attitude toward the problems of the west. Heretofore the members of the Railway Board have been lawyers and railroad men.

"No better choice could be made," says the Calgary Albertan, editorially, adding, "He knows Western Canada as few men know it. He is well acquainted with agricultural problems, and he is not unfamiliar with railway matters. He is a sage in his way, a man with a wonderful amount of valuable information, a keen reader of human nature, with a rare sense of justice. He will be an ideal member of that very important board, the Dominion Railway Board."

Dr. Rurtherford is the dean of live stock men in Canada, and is widely known in the United States as well as in Canada, for he has held many important posts and done professional work of a high order.

Born on December 5, 1857, the son of the Rev. Robert Rutherford, M. A., he received his first education in the Glasgow, Scotland, high schools, and finished his studies at the Ontario Agricultural College and the Ontario Veterinary College. He later practiced veterinary medicine in Canada, the United States and in much-troubled Mexico.

In 1884 he went to Portage la Prairie, where besides practicing his profession he undertook horse breeding. From 1887 to 1892 he was government veterinary inspector for Manitoba,

and a member of the provincial parliament. He went to parliament in 1887.

Dr. Rutherford held the post of Dominion veterinary director general from 1902 to 1912, and was Dominion Live Stock Commissioner from 1906 to 1912. He was also the Canadian representative to the International Institute of Agriculture, held in Rome, Italy, and delegate to the International Congress on Tuberculosis, held in Washington, D. C. In 1908 he was elected president of the American Veterinary Medical Association.

He was chairman of the International Commission of Control of Bovine Tuberculosis; president of the Dominion Horse Breeders' Association, president of Western Canada Live Stock Union, and served as veterinary officer to the Northwest Field Force, and in the Riel Rebellion.

G. LEININGER, Clay, Robinson & Co.

DRAFT OF B. A. I. V. CLASSIFICATION BILL.

At the first national convention of the National Association of Bureau of Animal Industry Veterinarians, held in conjunction with the fifty-fifth annual session of the American Veterinary Medical Association, Philadelphia, Penn., August 19-22, 1918, a classification bill was adopted which is to be presented to Congress and which contains the following salient features:

Class A—Entrance salary of $2,040 per annum, with an annual increase of $120 until their salaries shall be $2,520 per annum; for veterinary inspectors assigned to any form of routine work conducted by the Bureau of Animal Industry.

Class B—Salary $2,640 per annum, with annual increase of $120 for each year they serve, not to exceed $3,240 per annum; for veterinary inspectors assigned to a supervisory work under the direction of an inspector in charge in any branch of the service conducted by the Bureau, inspectors in charge at small stations, assistant inspectors in charge at large stations, and veterinary inspectors assigned to investigational work by the Chief of the Bureau.

Class C—Salary $3,400 per annum, with an annual increase of $120 until their salaries shall be not less than $4,000 per annum; for veterinary inspectors assigned to stations of greater importance than Class B, and those doing special investigational work for the Bureau.

JAPANESE–ENGLISH ROAD RULES.

Some Japanese-English rules of the road have been issued as a guidance to the conduct of motor drivers in the Flowery Kingdom. They read like this:

"At the rise of the hand of policeman stop rapidly. Do not pass him by or otherwise disrepect him.

"When a passenger of the foot hove in sight, tootle the horn trumpet to him melodiously at first. If he still obstacles your passage tootle him with vigor and express by word of the mouth the warning 'Hi. Hi.'

"Beware of the wandering horse that he shall not take fright as you pass him. Do not explode the exhaust at him. Go soothingly by.

"Give big space to the festive dog that make sport in the roadway. Avoid entanglement of dog with your wheel spokes.

"Go soothingly on the grease mud, as there lurk the skid demon. Press the brake of the foot as you roll round the corners and save the collapse and tip up."—Exchange.

HORSES HELPED TO WIN THE WAR.

A correspondent of the Sunday Journal thinks the horse is in danger of disappearing. But the faithful beast has survived all the vicissitudes of tractor competition up to date and we can still be hopeful for his future.

The correspondent says:

It may not be during this generation, but it does seem to me that it will be in the not far distant future that the faithful horse will become extinct. Of course, this stage will be reached only gradually, as the animal is still and will be for years to come popular as an important adjunct to the sporting game.

The horse, as a matter of fact, is a good deal more than "an important adjunct to the sporting game." He is doing his full share in the work of the world. For one thing, he helped to win the war. A great host of horses and mules were shipped to the battle front. They were invaluable for the transportation of supplies and the smaller guns. They can go where it is impracticable for motor cars to penetrate. They are still in active use; moreover, in the cavalry branch of the service, the prophets who thought that the horse-borne soldier was obsolete have been confounded by the recent events.

"If," says the Sunday Journal correspondent, "the horse is displaced with the same rapidity in the next ten years that it has been in the past ten years, I believe that I shall not be far out of the way in my theory."

Let us see.

From the latest issue of the Government Statistical Abstract the following figures are taken of the number of horses in the United States:

1850	4,336,719
1860	6,249,174
1870	8,249,000
1880	11,202,000
1890	14,214,000
1900	13,538,000
1910	21,040,000
1915	21,195,000
1916	21,159,000
1917	21,210,000

These figures speak very eloquently for themselves. There are more horses in the United States today than ever before—or there was in 1917. In spite of our shipments to Europe, it is safe to say we have something like 21,000,000 left.

It is plain enough that the horse is in no immediate danger of becoming extinct. If he is a less familiar sight on our city streets, nevertheless there are abundant tasks for him elsewhere. We have an interesting light on the whereabouts in further figures from the Statistical Abstract. In 1900 there were 18,267,020 horses on farms, and in 1910 the number had risen to 19,833,113.

In spite of the introduction of the farm tractor, the horse continues to be an invaluable industrial factor in America. We see him less often than formerly attached to a buggy, surrey or carryall. He has been ousted from the fashionable private stable by the invading motor car. The old-time procession of hacks at funerals is giving way, it appears, to the "automobile cortege." But the horse has a secure place in our national scheme of things. He is "sure of his job" for an indefinite time to come.—Providence Journal.

FARMERS AHEAD RAISING HORSES.

Prosperity for the American farmer will come riding in on the broad back of the Belgian draft horse. That is the opinion of J. D. Conner, Wabash, Ind., secretary of the American Association of Importers of Belgian Horses.

"There is a demand for 1,000,000 tractors in the United States," he said in an interview. "Add to that the new foreign demand and see how long it will be before this country is fully equipped. It won't be during your lifetime. Then remember the horse must be used along with the tractor.

"The war with its record of killing 5,000 horses a day has made it certain there will be a horse famine. There was shortage in 1914. Since then a million and a half horses have been exported.

"Belgium has representatives in this country to buy Belgian horses. Other European countries will make America the world's market for draft horses. The high price of feed will be no detriment to the business. The American farmer will find it profitable as well as patriotic to reach the maximum of production in good horses as well as other farm products."—Exchange.

Dr. J. R. Love has advised the Baton Rouge, La., office, supervising the work of tick eradication, that he expects to be mustered out of the army at an early date and would report for duty during the current month.

Dr. E. I. Smith, Inspector in Charge of the work of tick eradication in the State of Louisiana, attended the meeting of the United States Live Stock Sanitary Association, Chicago, Ill., and visited friends in New York State on his return.

Mrs. R. T. Churchill, widow of Lieutenant Churchill of the N. A. V. Corps, who died at West Point, was a victim of influenza followed by pneumonia and passed away early in November in New York City.

Dr. M. V. Springstun has been transferred from the Baton Rouge, La., tick eradication force to the same work on the Fort Worth, Texas force.

The New York State Veterinary College at New York University received a second gift in November of $5,000 from one of New York's good women who has become interested in veterinary medicine.